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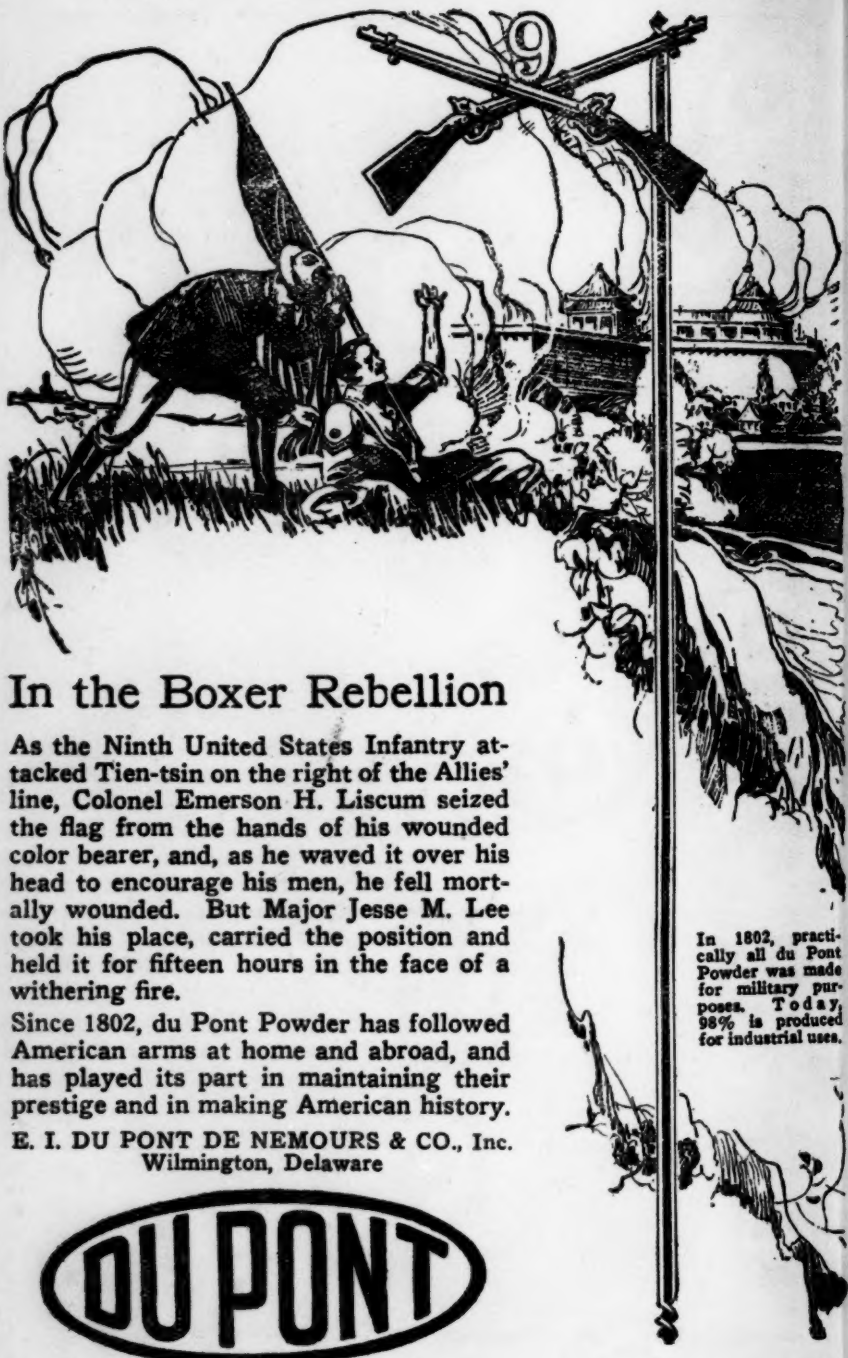

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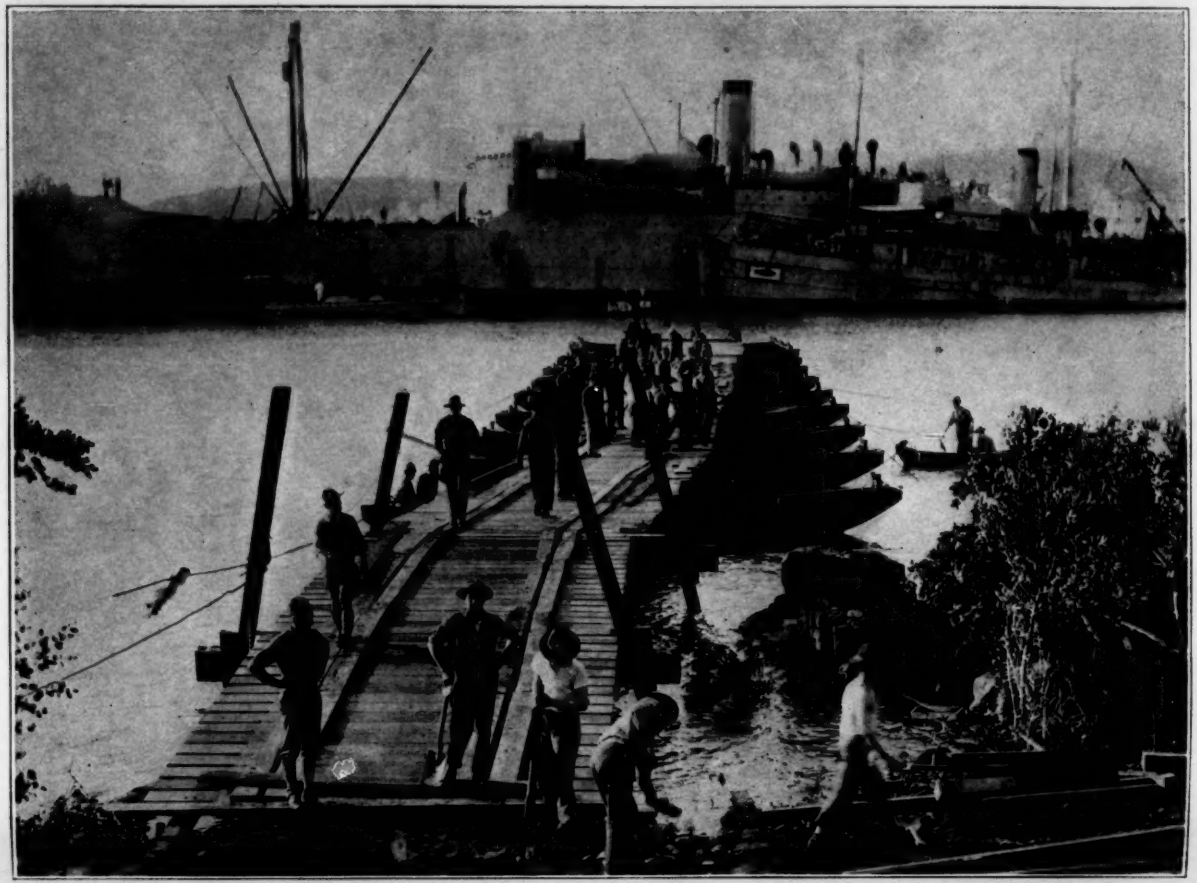


BUILDING PONTOON DOCK FOR LANDING HEAVY ARTILLERY AT CULEBRA. MARINE CORPS

Building Pontoon Dock for Landing Heavy Artillery at Culebra. Marine Corps

UNITED STATES NAVAL INSTITUTE PROCEEDINGS

Vol. No. 50, No. 4 April, 1924 Whole No 254

A STUDY OF OUR PROMOTION AND GRADED RETIREMENT LAWS

By Captain J. K. Taussig, U. S. Navy

Foreword

THE statutes governing promotion and retirement are important because they have a direct bearing on the morale of the officer personnel. The efficiency of the Navy as a whole depends, more than anything else, on the efficiency of the officers; and this efficiency, in turn, is greatly influenced by the morale. Therefore, if, as we so often see and hear asserted, the present promotion and retirement laws are adversely affecting the morale and efficiency of the officer personnel, the subject is one which is well worth receiving the attention of the entire service with a view to finding a remedy. This paper is a study, made with the purpose of determining whether or not changes in the laws are necessary or desirable, and if so, what the changes should be.

The laws discussed herein are only those which concern the line of the Navy. The statutes governing promotion and retirement in the staff corps are related somewhat to these laws. At present there is a proposal before Congress to make them much more closely related than is now the case. Therefore if the laws as they affect the line are not good in any respect, the defects in them and the remedies for these defects are as important to the staff corps as to the line.

The laws under which promotions and retirements (other than for disability) are made, may be paraphrased as follows:

1. The total number of line officers shall be four per cent of the authorized enlisted strength of the Navy. This authorized enlisted strength is 137,485 men. Four per cent of this number is 5,499, which, therefore, is the maximum number of line officers authorized.

2. The line officers actually on the navy list shall be divided in the various grades as follows:

For each 100 officers:

One in the grade of rear admiral.
Four in the grade of captain.
Seven in the grade of commander.
Fourteen in the grade of lieutenant commander.
Thirty-two and one-half in the grade of lieutenant.
Forty-one and one-half in the grades of lieutenant (j. g.) and ensign.

3. Promotion of the grades of rear admiral, captain and commander respectively shall be made on the recommendations of a board of nine rear admirals, from the officers in the next lower grade. The only restriction on the eligibility of officers is that they must have served four years in grade, at least two of which must have been at sea. The board, in making recommendations for promotion, is governed by two main factors. These are the oath, and the requirement that six votes are necessary for selection. That part of the law concerning the oath is: "Each member of said board shall swear or affirm, that he will, without prejudice or partiality, and having in view solely the special fitness of officers and the efficiency of the naval service, perform the duties imposed upon him as herein provided."

4. Compulsory retirement is effective:

(a) When any officer reaches sixty-four years of age.
(b) When any captain reaches fifty-six years of age.
(c) When any commander reaches fifty years of age.
(d) When any lieutenant commander reaches forty-five years of age.

5. Lieutenants (j. g.) must serve not less than three years in grade before being eligible for promotion.

6. Ensigns are promoted to lieutenant (j. g.) on the completion of three years' service in grade.

Before proceeding with the actual operation of these laws it is well to point out several significant features. These are:

(a) The authorized line strength has never been attained. At present it is approximately 1,000 short.

(b) The percentage authorized for lieutenants (j. g.) and ensigns is lumped, instead of being distinct for each, as is the case in all other grades.

(c) Promotion by selection is made only to the grades of rear admiral, captain, and commander. Promotion to the grades of lieutenant commander and lieutenant are made by seniority as vacancies exist. Promotions to lieutenant (j. g.) are made on completing three years' service in grade of ensign.

(d) Age in grade retirement is applicable only in the grades of captain, commander, and lieutenant commander.

There is a general impression that *something* is wrong with these promotion and graded retirement laws, especially in regard to the higher grades. There have been numerous discussions as to what these defects are. Sometimes these discussions have been augmented by suggestions for remedying the defects. Such suggestions usually recommend a return to promotion by seniority, or selection out; or combinations of these different methods. There are advocates of doing away with graded retirement altogether; and those who favor changing from "age in grade" to "length of service in grade" for the purpose of determining when officers who are not promoted should be forced to retire.

Before accepting any solution as the best one, or even as a good one, it might be well to make a brief review of just what the supposed defects in the laws are.

Present Operation of the Laws

The chief trouble seems to be not so much with what has happened to date, but with what is feared *may* happen in the future. The present policy of the selection board is one of elimination, rather than of selection. In other words the board, instead of selecting *the best* officers from among all those available, really eliminates a few near the top of the list, whom they consider not up to the average, or for other reasons. This policy has resulted

to date in no officers (other than those who are abnormally placed as regards age, such as ex-warrant officers) being retired on account of age in grade without having been passed over one or more times by the selection board. Nearly all the captains now on the list have been selected twice for promotion (and some three times including their temporary commissions); and all the commanders have been selected at least once. We can infer from this that the commanders are a little above the average that would have obtained had there been no selection; and that the captains are considerably above the average that would have obtained had there been no selection. So when it comes to selecting the captains for future promotion the board has a decidedly difficult task. The members of the board must keep in mind their oath, and in so doing, their conclusions must be accepted as being honestly derived. But if the policy of the board in recent years is the best for the efficiency of the service under prevailing conditions, we can not be blind, then, to two facts: first, that the captains promoted have been selected only from the *top* of the list of all those eligible; and second, the promotion of these captains at a comparatively young age has caused a hump which will, at a future date, deny the opportunity for promotion to some excellent men who may be better than those previously advanced. If the operation of the law thus far has actually worked that way it is a thing of the past, and one that is within the power of the board to remedy in the making of all future selections. Subject to these defects and the unavoidable errors of human judgments, we can accept the board's conclusions with confidence that they have performed with the best interests of the service in view, especially in that, up to the present, no officers have been retired for age in grade without having been given due consideration.

Effect of Changing Conditions

But in a few years, the conditions which now exist are going to change. Certain officers, either due to the age at which they entered the Naval Academy, or to the position in which they graduated, or to a combination of both of these, will be retired for age in grade without being seriously considered by the board, provided the present elimination policy continues effective.

A study of the captain's list with relation to prospective promo-

tions and retirements based on a continuation of the present policy by future selection boards, has resulted in the following table:

TABLE I

1	2	3	4	5	6	7
	During previous 12 months				*Junior Rear Admirals*	
Date	Number of rear admirals who retire on reaching statutory age of 64 years.	Net increase in number of rear admirals due to graduates, Naval Academy, etc.	Contemplated casualties including officers who probably would be passed over.	Number of captains who will retire age in grade without being considered by selection board.	Name	Lineal position on captain's list on Jan. 1, 1924.
July 1, 1924	1	2	1	0*1	Willard	(5)
July 1, 1925	4	2	3	3*2 (1)*3	Leigh	(13)
July 1, 1926	1	2	2	8*2 (4)	Blakely	(21)
July 1, 1927	2	3	2	6 (1)	Olmstead	(34)
July 1, 1928	6	0	3	1	Luby	(54)
July 1, 1929	2	0	2	1	Laning	(60)
July 1, 1930	3	0	2	12 (1)	K. M. Bennett	(68)
July 1, 1931	7	0	3	11 (4)	Sargent	(86)
July 1, 1932	5	0	2	17 (7)	Tarrant	(102)
July 1, 1933	11	0	3	25 (4)	Hyland	(135)
July 1, 1934	10	0	3	16 (6)	Dodd	(160)
Tota's	52	9	26	100 (32)		

*1 Half year in this case.

*2 Includes one officer previously passed over.

*3 Numbers in parentheses refer to officers who have lost position on list due to action of previous selection boards or for other reasons.

In this table the figures were derived as follows:

Column 2. Ascertained from the Navy Register of January 1, 1923. These figures may be changed only by casualties in the rear admiral's list as it is now made up; excepting the number (10) for July 1, 1934, which may be slightly different owing to the fact that retirements then will depend on individual officers who may be selected after January 1, 1924.

Column 3. The total (9) is fixed, as that number brings the rear admirals to fifty-five, the maximum number allowed by the present law. There may be a slight variation in the numbers as assigned to definite years.

Column 4. The figures in this column are the estimated number of casualties based on past records. They include those captains who will probably be passed over by the selection board. Those so passed over would be added to the numbers in column six in ascertaining the total of captains who will retire.

Column 5. These numbers are based on the selection board continuing a policy of elimination rather than of selection up. The figures in it will change only in so far as officers may previously die, or retire for disability or thirty years' service, or in so far as the selection board reaches down and picks up individuals who would retire for age prior to the next meeting of the board.

Columns 6 and 7. These show the junior rear admiral on July 1 each year based on the figures of the other columns and his lineal number on the captain's list on January 1, 1924. The names may vary according to whether or not the individuals indicated are selected by the board. However this may be, the junior rear admiral in each case will be some officer whose position in the list is close to the one indicated in the table.

We see from the foregoing that the first age in grade retirement of a captain, due solely to his normal position on the navy list, will take place between July 1, 1924 and July 1, 1925; and that during this twelve months there will be only one such officer so retired. Of the other two who will retire if not promoted, one has already been passed over for rear admiral, and the other has lost position, owing to the action of a previous selection board.

In the following year there are eight captains, four of whom are in their normal positions on the list, who will retire on age in grade if not promoted. It is at this point that the selection board, in considering "The special fitness of officers, and the efficiency of the naval service," must decide as to whether or not their present policy of elimination will be continued, or whether the efficiency of the service will require them to select those whose special fitness warrants it, irrespective of their position on the list.

From the present (January 1, 1924) until July 1, 1929, there

will be, under the prevailing procedure, seventeen captains to retire for age in grade, and of this seventeen, twelve are in their normal positions on the list. This is a new and serious situation, not only for the individuals concerned, but also for the service at large. This is because among these captains are *some* of the most capable in the Navy, officers who are, without doubt, above the average of all those on the list who are eligible for consideration by the selection board.

Beginning July 1, 1929, there are more officers adversely affected until we come to the year ending July 1, 1933, when there will be twenty-five captains who must retire for age in grade during the twelve months. Now the selection board cannot reduce the total (126) of casualties and retirements in the captain's list during the next ten years; but it has within its power the determination of exactly who the individuals are who must retire. Can the board determine this so as to give all captains a fair chance for promotion, and, at the same time, make the selections with a view to the special fitness of the officers and the efficiency of the service?

Future Policy of Selection Boards

Let us suppose, for example, that the following procedure is adopted by the selection board: After meeting, and before the beginning of the selections, a block of names, taken from the last Navy Register, is determined on, from which the selections will be made. This block includes, *under all circumstances,* all captains who, being in their normal positions on the list (that is never having lost numbers for any reason whatever) will, if not selected for promotion at this meeting of the board, retire for age in grade before the selections made by the next board become effective. Or this block *may* include, at the discretion of the board, all captains who will so retire, irrespective of whether or not they had previously lost position. The board may, of course, with propriety, select from even a larger block, being limited only by the length of service requirements. However, in view of the recognized fact that experience in one grade is an asset for efficiency in the next higher grade, it would seem that under normal peace time conditions the efficiency of the service would limit the block so as to include only all of those who if not promoted, would retire before the next meeting of the board.

To show what is meant by this, let us take as a specific example the twelve months from July 1, 1925 to July 1, 1926. During this twelve months a number of captains who are in their normal positions will retire for age without due consideration, provided the board continues its policy of elimination. Believing this not to be best for the efficiency of the service, the board decides to select from a block that will insure all captains obtaining a chance for promotion. The last captain still in his normal position, who, if not promoted, retires for age in grade during that coming year, is Trench. The last captain, including those who have lost numbers, who, if not promoted, will retire for age in grade during that coming year, is Reed. The board is to make five or six selections from the block on the list beginning with Brotherton (who it is estimated will be the senior captain) and ending with Trench or Reed as the board may decide. In this first block there are seventeen officers, and in the second there are twenty-five. Let us say, for illustration, that the board intends to include only so far as Trench in its considerations on the ground that it would not be conducive to service efficiency to consider any officers lower down. It then has the task of picking the five or six *best* captains from this block of seventeen irrespective of their relative positions on this limited list.

There may be pointed out several difficulties or possible objections to this plan. The greatest one would seem to be in deciding who *are* the best five or six in the total of seventeen from whom the selections are to be made. Probably most of us will agree that in any such list of captains there will be one or two who stand out as above the average in the block, and there will probably be one or two who stand out as below the average. Concerning these, there would be no question. There are then left, say, thirteen captains all of whom appear to be of about an average in ability and efficiency, from whom the board must select three or four. The difficult part in this is that an officer who is the best to one member of the board, may or may not be the best to another member, and so on. Therefore, the selection of these three or four who are of average ability must be made as the result of *study*, probably followed by balloting, and compromise. In making the study of the special fitness of officers for promotion it seems that consideration should be given, not only to the

fitness as shown on the efficiency reports of the officers concerned, but, *to the special fitness of each officer for occupying a position of high command.* The reports of fitness made on each officer cover the performance of a specific duty actually performed. Although the manner of performing such duty may have been excellent, and the reports, therefore, excellent, such reports do not necessarily show that the officer has special fitness for *higher* command. In considering this special fitness for higher rank, there are a number of contributory elements besides that of the manner of performing past duty. Some of these are:

(1) The *kind* or *class* of duty performed;
(2) The officer's personality: i.e., temperament, etc.;
(3) His service reputation;
(4) His physical condition.

If the members of the board take all of these elements into consideration in connection with the records of the officers, it is held that the task of selecting the best officers for high rank will not be so difficult as most of us imagine. Should it be known that some such procedure has been adopted, whatever the result, our faith in the integrity of the board must of necessity be such as to convince the service that the best possible has been done.

Another objection to this procedure may be made by those officers who are under the average age and who therefore have another opportunity for selection in case they are passed over by the board. These officers may feel that solely because they will again have this opportunity, the selection board may pass them by in favor of some officer, or officers, who, if not promoted then, will retire for age. Such a procedure would, of course, be detrimental to the morale of the individuals concerned. But here again we must have faith enough in our rear admirals who comprise the selection board to feel that before such procedure is adopted they will give full consideration to "the special fitness of officers and the efficiency of the naval service."

The great advantage in the system suggested, especially if it becomes general knowledge that the selection board will adopt some such method, is that those officers who now feel they are inadvantageously placed, owing to age, will know that they are going to have a fair deal, and thereby their morale will be greatly strengthened. And, as is seen from the table previously referred

to, the number of such officers is sufficiently large for the effect of their morale to have a bearing on that of the service as a whole.

While in the preceding discussion the captains have been used as an example, the same reasoning would apply to the commanders and lieutenant commanders.

It is evident from the foregoing that it is now within the power of the selection board to insure to every officer who is in his normal place on the list a fair opportunity for promotion. We thus see that the greatly feared prospective evil that some of the best officers will be retired without being given due consideration can be eradicated without resort to a change in the basic law.

Let us now consider whether or not there are other reasons for changing the fundamental principles of the selection and graded retirement laws.

The chief objects of these laws are:

1. To retain in the service those officers who are best fitted for higher command.

2. To insure the officers so retained reaching the various grades at suitable ages.

3. To insure a suitable flow of promotion.

It must be conceded that these objects are desirable and necessary for the efficiency of the service. Can they better be attained:

1. By discontinuing selection in any form and returning to promotion by seniority?

2. By changing the form of selection?

3. By doing away with graded retirement?

4. By changing the form of graded retirement?

5. By other changes?

Selection vs. Seniority

While there are some advocates for the return of promotion by seniority, the consensus of opinion within the service is certainly against this procedure. Where only a limited number of officers can attain the higher grades, it cannot be assumed that the efficiency of the service will be as high as desirable if the highest ranking officers may be those who make the grade simply on account of their relative positions on the navy list, or because they have succeeded in keeping out of trouble. As only a comparatively few reach the highest rank, and as these few bear a great

responsibility not only to the service, but to the country, every endeavor must be made to insure the promotion of the most efficient. The survival of the most efficient can be attained only through some form of selection. Therefore the Navy will fail in its duty to the country if it advocates a return to the antiquated method of promotion by seniority.

There are other decided drawbacks to promotion by seniority in the higher grades. For example, a return to this method will see the navy list revert to that condition where all the captains are comparatively old men, and where all the rear admirals have only from a few months to a few years to serve in the grade. No argument is necessary to show that this condition is not conducive to efficiency. Another example to show the undesirability of the seniority method is the effect on the retired list. By this method the retired list of rear admirals assumes proportions that alarm the Congress, and place all of the retirement laws in jeopardy. While, under any conditions, our retired list is bound to grow during the next ten years, the psychological effect on the law makers of a long list of rear admirals is much worse than that for the other grades.

There have been no arguments presented that show promotion by seniority can accomplish any of the three main objects of our present laws. The conclusion is, therefore, that if the laws are to be changed, promotion by seniority should not replace some form of selection.

Having decided that selection is essential for efficiency, should we revert to selection out in preference to selection up?

Selection Up vs. Selection Out

The chief arguments against selection up are two-fold. One is that injustice has been done to individuals, and will continue to be done under this method. It is true that in the past some officers may have been unjustly passed over. That such has been the case, or even may again be the case, is, of course, extremely bad for the morale of the individuals concerned. But the service knows that such cases of injustice have been few in number. In fact they are so few they cannot have affected the morale of the service at large.

The other argument against selection up is that while the law

has contemplated selection up, the selection boards, to date, have followed a policy of elimination which is comparable to selection out. It has already been shown that this is not the result of the intention of the law, but is one of operation which it is within the province of the selection board to change.

The deleterious effect on morale that is felt by the service owing to the *possibility* of a large number of officers being retired without proper consideration, has been shown to be based on conjecture. In other words we are crossing a bridge before we come to it, and the evil of such a procedure can be remedied by the board using the powers invested in it by the law.

Some selectionists favor selection *out* rather than selection *up*. They would revert to the old "plucking board" plan as being a better one for the service. Their chief argument in favor of this method is that when an officer is "plucked," he is immediately retired and thereby takes his grievance with him, leaving the rest of the service to continue on its way undisturbed. But as all officers of the ranks of lieutenant to captain inclusive were subject to selection out, we all know that the rest of the service did not continue on its way undisturbed. All of us who are old enough remember how, before each board met, there was fear and trembling all along the line, which feeling was not conducive to morale or efficiency. The plucking method served its purpose, and having so served met the natural death which was coming to it.

One argument of the selectionist against the present form of the law has been that those officers passed over remain in the service until the retiring age is reached and thereby keep their grievances within the service. There have been good grounds for this argument. But conditions are changing so that within a year or two we will come to that stage where practically all officers who are passed over will retire for age almost immediately. This is because we are approaching a balance where the *average* age of the top officers in each rank will be within a year of the age in grade retirement requirement. So the argument no longer holds good.

The plucking system left a stigma on all those selected out. Up to the present the selection up system has left a stigma on all those passed over. If we again take up the plucking system the officers adversely affected will again feel the stigma. By continu-

ing our present system there will soon come a time when only a few officers in a more or less large block will be advanced and the rest in the block will retire. In other words the time is approaching when the normal status of the individual will be to be passed over, and the abnormal condition to be promoted, instead of continuing as at present where it is the normal condition to be promoted and the abnormal to be passed over. Under these new conditions the stigma in being passed over will be obliterated and we will accept the view that for the greater part of the service the top rank is that of captain and the rank of rear admiral is only for the exceptional few.

Finally in considering these two methods we see that selection out may eliminate the most inefficient, but it does not insure the promotion of the most efficient. In fact by resorting again to selection out we would be confronted with some unsatisfactory situations, so far as actual promotion is concerned, similar to those which present themselves with promotion by seniority.

The conviction reached from the foregoing arguments is that selection *up* is a better form for the higher grades than is selection *out*. Up to this point the conclusions are:

(1) That the satisfactory operation of the present selection laws, in so far as fairness to all officers of the upper grades is concerned, is entirely in the hands of the service.

(2) That some form of selection is essential for best efficiency.

(3) That selecion *up* is better than selection *out*.

Graded Retirements

The feature of "Graded Retirement" was first adopted in our Navy to accompany the present selection *up* law. It was recognized that unless some such system were devised, the upper part of each grade would become clogged with officers who had been passed over for promotion.

Aside from the undesirable feature of retaining on the active list officers who have been passed over, which feature has been previously discussed, the holding over of large numbers of such officers has two additional marked defects. The first of these is that it retards the flow of promotion by preventing a number of younger officers coming in at the bottom of the grade. The second is that for efficient duty in grade or rank, officers must not

be over a certain age. For example it is well recognized that officers as they grow older become unsuitable for watch duty; or that officers beyond a certain age are too old for destroyer or submarine duty, etc. Therefore, if we have a number of officers at the top of each grade who are too old properly to perform the duties that rightfully belong to that grade, these officers of necessity form a "special privilege" class, which not only has the undesirable features which always go with special privilege classes, but also adversely affects the efficiency of the service as a whole by depriving it of the services of other officers who are of suitable age efficiently to perform the legitimate duties of their rank.

So a proper flow of promotion and efficient service by the greatest possible of numbers demand that there be some form of graded retirement.

Age in Grade vs. Length of Service in Grade

Would the objects necessary of attainment by graded retirement be better accomplished by some other system than age in grade?

The only other system discussed, in so far as is known, is one which has for its basis, length of service in grade. The advocates of this method advance several arguments in its favor. The chief of these is that by substituting length of service for age, all officers in their normal position on the list will have equal opportunity for promotion, and that the deleterious effect on morale now apparent in so many officers who consider themselves disadvantageously placed simply on account of age, will be eliminated.

The other argument for the adoption of this system is that officers who have come up through the ranks, and those who have been commissioned from civil life through the reserve, will be given an opportunity for reaching the higher grades, which opportunity is now denied them.

If there are any other advantages of "length of service in grade" retirement over "age in grade" retirement, they have not been elucidated.

Before deciding whether or not these advantages claimed for length of service in grade retirement warrant a substitution of this system for the present one, let us discuss the disadvantages which would go with such a system.

The first one that comes to mind is, that while now we are leav-

ing to our board of rear admirals the determination of the block of officers from which they will make selections for promotion, the new system would practically bind the board to select from a certain definite block. In other words, we would be taking out of our own hands one of the discretionary powers of determining what is best for the efficiency of the service, and replacing this valuable asset by a hard and fast legislative rule which may or may not work for attaining the best results.

We have seen that it is within the discretionary power of the selecting board to insure to all officers a fair chance for promotion, and that up to date all officers have had this chance. The fear that this same opportunity may not be given in the future is an unjustifiable one; and if, as is asserted, the morale is being adversely affected, the officers concerned are borrowing trouble. Before determining against the present law on account of a future possibility of unsatisfactory operation, and substituting for it something of uncertain worth, let us wait until that river is reached and find out whether or not the bridge is down. The conclusion reached by previously advanced arguments given herein is that we will find the bridge up, with full opportunity for the most deserving to cross, irrespective of their position in line.

Age in grade has a decided advantage over length of service in grade in that there can be no complications as to its workings. While on the surface it appears that length of service in grade would mean that all members of a graduating class from the Naval Academy would rise or fall together, it would be many years before such a condition would prevail above the grade of lieutenant commander. A perusal of the present list of captains and commanders shows that officers who prior to promotion had lost numbers for any reason whatever, would, by the adoption of a length of service in grade law, still be available for selection after their classmates or younger officers have been placed on the retired list. Of course this would not be desirable, and can not be conducive to efficiency. It would simply mean replacing what is now considered a specially favored class (that is the officers who are young for their positions on the list) by another favored class made up of the older men and those who had previously lost numbers and then later been promoted. It may be argued, of course, that any law which requires length of service in grade

retirement would provide for such exceptional cases. But it is well known that it is extremely difficult properly to frame such laws as to insure their satisfactory operation.

Length of service in grade retirement would not relieve the selection board of the difficulty which now besets it in selecting the best officers. It may increase this difficulty owing to the fact that in some years the board would have to select a few officers from a much larger block than is now the case.

There is a certain amount of solicitude felt for those officers who have been commissioned in the regular service from sources other than the Naval Academy. The officers are, of course, a special class, something which they undoubtedly thoroughly understood when they accepted their regular commissions. The law which authorized their entry into the regular service also recognized that such officers formed a special class, particularly in so far as age in grade retirement was concerned, by providing that these officers, "Shall not be ineligible for promotion by reason of age . . . until they have rendered ten years' service in the grade of lieutenant commander, six years' service in the grade of commander, or eight years' service in the grade of captain, respectively . . . ."

So the guarding of the interests of these officers cannot be used as a legitimate argument in applying length of service in grade retirement to the whole. It is even held that the above provision of law as applicable to these officers is not conducive for efficiency as it eventually makes of them a special privilege class in that they will serve in a grade when they are too old to perform the legitimate duties of that grade.

It is not apparent how a change in the present graded retirement law would, in any way, give to officers of the higher grades a fairer chance for promotion than it is now within the power of the selection board to give and at the same time maintain the efficiency of the service. The conclusion, therefore, must be that a change in the basic law so as to provide for retirement by length of service in grade is neither necessary nor desirable.

The conclusion thus far reached is that those parts of the law which provide for selection up and age in grade retirement are basically sound and provide for safeguarding the efficiency of the service in so far as the upper grades are concerned. But it must

be borne in mind that the arguments presented have only referred to the basic principles as applied to these upper grades. There has been no discussion as to whether or not these same principles should be applied to the lower grades, or whether or not the ages for retirement, as now provided, are the best for the efficiency of the service.

A complete study of these laws involves discussion on the following questions:

1. Should the retirement age for rear admirals be changed from sixty-four years?

2. Should selection and graded retirement be extended to the grades of lieutenant and lieutenant (j. g.)?

3. Should the retirement ages of fifty-six, fifty and forty-five respectively in the grades of captain, commander and lieutenant commander be changed?

4. Should the distribution of officers in grades be changed from those now authorized?

Before considering these important questions it is desirable at this point to emphasize certain features with regard to the operation of the present laws. Since their adoption, the navy personnel has not only been through a period of abnormal expansion followed by one of equally abnormal contraction due to the war and its aftermath, but, in addition, it has been subject to the unsatisfactory conditions incident to the radical change in the method of promotion of officers. We have been passing through a transitory period from the old method to the new, and not yet, after a period of nearly eight years, has the officer personnel reached that stage of stability and normalcy in which it is supposed to be for the proper operation of the law.

These abnormal conditions produced results as follows:

1. Officers have been promoted all along the line at ages younger than normal conditions will warrant.

2. Humps have been created in all grades above that of lieutenant. The evil effects of these humps have not yet been felt, owing to the annual net increase made by Naval Academy graduates.

3. Immature and incorrect judgment as to the future operation of the law.

What the effect of the law will be when this condition of sta-

bility and normalcy is reached can best be studied by projecting ourselves ahead to that time. However, before doing that, we can discuss two questions. First, in regard to the retiring age of rear admirals, as that should be fixed, whatever other changes may develop as desirable. Second, whether or not some form of selection and forced retirement should be applied to the grades of lieutenant, lieutenant (j. g.), and ensign.

Retiring Age for Rear Admirals

So far as is known, no one has advocated an increase in the retiring age of sixty-four, as now provided by law, for rear admirals. However, the suggestion has frequently been made, especially with a view to relieving the coming congested conditions at the top of the grade of captain, commander, and lieutenant commander, to reduce the age retirement from sixty-four to sixty-two years.

In order to ascertain the effect of such a change a study was made with the following results:

1. From July 1, 1924, until July 1, 1929, the average age of captains promoted to rear admiral would be reduced from fifty-four and fifty-five years to fifty-three and fifty-four years. This would eventually lead to a hump similar to that which now exists owing to the promotion of a large number of captains at abnormally young ages.

2. That during this five year period only two captains would be saved from age in grade retirement.

3. That from July 1, 1929 to July 1, 1932 the average age of captains promoted gradually increases to fifty-five years. This eventually leads to a condition similar to that which we are now approaching; and when that condition is reached, all benefits from the reduction in the retiring age will disappear.

4. That during this three year period there would be twelve captains saved from age in grade retirement.

5. That it is impracticable to make reasonably correct estimates after July 1, 1932, because on that date all rear admirals now on the active list will have been retired, and retirements after that date will depend entirely on the individual officers who may be selected, beginning with the next meeting of the board in June, 1924.

6. That while this change in the law would benefit some captains by giving them earlier promotion, and other captains by giving them promotion which would otherwise be denied, at the same time it would, at a later date, be of a decided disadvantage to a number of officers who will lose opportunity for promotion on account of the block made by these abnormally young rear admirals.

7. That after normal conditions are reached and with the retiring age for captains remaining at fifty-six, the average length of service for rear admirals would be reduced from eight and one-half years to six and one-half years thereby increasing the average number of retirements from six and one-half to eight and one-half and making a corresponding increase of two in the number of captains promoted each year. While this promotion of two additional captains each year would be of great benefit to the individuals concerned, the addition of two additional rear admirals to the retired list each year would probably have an effect on the law makers that would not be beneficial to the service as a whole. It is therefore considered better that the retiring age of sixty-four remain as at present.

Selection vs. Promotion by Seniority for Lieutenants, Lieutenants (j. g.) and Ensigns

The conclusion that the law is basically sound in that it provides for selection up and age in grade retirement in the grades of captain, commander and lieutenant commander naturally leads to the query as to whether the same provisions should be made for the lower grades.

It may be argued that seniority without any form of selection is good enough for the lower grades, and that the efficiency of the service will be adequately safeguarded by continuing this method. But such arguments have not sound reasoning to support them. Not only does promotion by seniority result in the advancement of some officers whom the service would be better off without, but, when taken in connection with selection in the upper grades, will eventually cause humps in the grades of lieutenant and lieutenant commander resulting in officers not being promoted to lieutenant until they have served seven and one-half years as lieutenants (j. g.), and not being promoted to lieutenant commander until they have served eight and one-half years in

the grade of lieutenant. This can better be understood by reference to Table II which will later be considered. It will then be seen that there must be some way provided for getting rid of the excess numbers of officers in the lower grades.

The only two methods for accomplishing this are selection up with age in grade retirement, and selection out. There is no question but that selection up with age in grade retirement would be the better method if any way could be found to assure the selection of the officers best fitted to perform the duties in the next higher grade. But the conditions that prevail in these junior grades are very different from those in the senior grades. The junior officers on whom judgment must be passed are more or less in the formative stage; they have been only a few years in service; and there are so many of them that no board of senior officers could fairly judge of their relative efficiency. And, if a board of officers cannot fairly judge this matter, there is certainly no other way of doing it. Therefore, we must reject selection up in these grades simply because there is no fair way of making the selections. As graded retirement goes only with selection up, it also must be rejected for these lower grades.

But while we can find no way of insuring the promotion of the most efficient in these grades, it is not so difficult to ascertain who are the least efficient. The reports of fitness of these younger officers will show that many of them are below the average in one or more respects, and it becomes common knowledge that some could be eliminated without loss to the service. It is believed that such eliminations of the least efficient could be made with far more fairness to the large number of officers concerned, than could be done by selection up of the most efficient. Therefore, as *some* way must be provided for insuring a proper flow of promotion in these lower grades by getting rid of a certain percentage of officers (which promotion by seniority does not accomplish) the conclusion is that this can best be done, both in fairness to the officers and for the efficiency of the service, by having selection *out* in the grades of lieutenant, lieutenant (j. g.) and ensign.

Future Operation of Present Laws

In order to study the future operation of the present laws when conditions become normal, which will be within a few years

after the total number of line officers reaches the maximum authorized strength of 5,499, the following table is inserted. The figures give a correct picture of what will occur provided no changes are made in the present laws. The results are so different from what was contemplated that the table is worthy of careful scrutiny, especially as herein will be found the basis for recommending changes in the law which will be essential for its future practical operation.

TABLE II

SHOWING EFFECT OF PRESENT LAWS WHEN MAXIMUM AUTHORIZED STRENGTH OF 5,499 LINE OFFICERS IS REACHED

	1	2	3	4	5	6	7	8	9
Rank	Authorized Percentages in grade.	Number in each grade based on total of 5,499.	Average age on attaining grade.	Number of years in each grade.	Annual number of vacancies that must be made: column 2 ÷ column 4	Number of retirements plus casualties.	Probable loss due to 3% estimated casualties.	Average annual number of forced retirements.	Percentage of forced retirements.
Rear Admiral	1	55	55	8.5	6.5	8	1.5	6.5	11.8
Captain	4	220	49	6	37	30	6.5	23.5	10.7
Commander	7	385	44	5	77	40	11.5	28.5	7.4
Lieutenant Commander	14	770	40	4	192	115	23.0	92.0	12.0
Lieutenant	32.5	1787	31.5	8.5	210	53.5	53.5	0	0
Lieutenant (j.g.)	41.5	2282	24	7.5	217	68.5	68.5	0	0
Ensign			21+	3					
Totals	100.0	5499				315.0	164.5	150.5	

* Annual number of additional officers required each year.

ANALYSIS OF TABLE II

Columns 1 and 2 show respectively the authorized percentages in grade and the numbers that will be in each grade when the maximum total of 5,499 is reached.

Column 3 shows what the average age of the officers will be on attaining each grade. As these ages are, in all cases excepting those of ensign and lieutenant (j. g.), considerably above those at present, it is well to explain how they were derived. The ages of fifty-five, forty-nine and forty-four respectively result

from the provision of law that requires captains, commanders and lieutenant commanders to retire at the ages of fifty-six, fifty and forty-five respectively. So far, officers have been promoted considerably under these ages; but the average age of promotions is gradually increasing, and will continue to do so until, in each case, it is one year less than the retiring age.

The age of twenty-one for ensigns is the average for midshipmen graduates. That of twenty-four years for lieutenants (j. g.) is fixed by the statute requirement that ensigns will be promoted on completing three years' service in grade.

There is no definite provision of law which can be used for fixing the average age at which officers will reach the grades of lieutenant and lieutenant commander. The respective ages of thirty-one and one-half and forty given in the table were obtained by computing the ratios between the average age of twenty-one at graduation and the average age of forty-four when officers will reach the grade of commander.

Column 4 shows the number of years officers will spend in each grade based on the ages given in column 3. The figures in these two columns (3 and 4) demonstrate that we are approaching an unsatisfactory situation both as to ages on promotion to the various grades and as to length of service in the various grades. These unsatisfactory conditions may be briefly summarized as follows:

1. There is no regularity, either progressively or otherwise, as to increase in ages from grade to grade or as to the number of years spent in each grade.

2. Some of the average ages at which officers will attain different ranks are too high for best efficiency.

3. The length of time to be spent in the various grades is too long in some instances (seven and one-half and eight and one-half years respectively for lieutenants and lieutenants (j. g.),); and too short in others (four and five years respectively in the grades of commander and captain).

Column 5 gives the average annual number of vacancies that must be made in order to carry out the provisions of the law. The figures in each case are obtained by dividing the number in grade (column 2) by the number of years in each grade (column 4). Column 6 shows the number of retirements plus casu-

alties that must occur annually in each grade, as based on the figures in column 5. The total (315) shown in column 6 is the number of additional officers (Naval Academy graduates plus other sources) that are required each year to provide for the annual losses. Column 7 shows for each grade the annual number of casualties in that grade, based on three per cent of the total. In columns 8 and 9 are given respectively, the annual number of age in grade retirements and the percentage of the whole number in that grade.

The figures in columns 6 and 8 do not require any argument to show that something is radically wrong. There is no apparent regularity or connection between the retirements plus casualties in one grade and that of another. On the other hand the utmost irregularity exists. For example there must be 115 annual retirements plus casualties in the grade of lieutenant commander, while in the grade of lieutenant there will be only fifty-three and five-tenths annually and in the combined grades of lieutenant (j. g.) and ensign only sixty-eight and five-tenths annually, all due to casualties. There must be ninety-two retirements annually in the grade of lieutenant commander due to age, while in the lower grades there will be no such retirements.

The reasons for these anomalous conditions now become apparent. They are due:

(1) To the fact that the ages fixed for retirement in the grades of captain, commander and lieutenant commander are not in all cases right, nor in the proper ratio, therefore causing irregularity both in the length of service in these grades and in the numbers of forced retirements that must occur.

(2) To the provision of law which while rightfully requiring selection up and age in grade retirement in the upper grades, leaves promotion in the lower grades to seniority and casualties.

(3) To incorrect ratios between the fixed percentages in grade, which result in an unsatisfactory distribution of the officers in respect to the duties that properly belong to the several grades.

The Remedies

It has been previously pointed out that proper promotion and retirement laws have as their main objectives: (1) the retention in the service of those officers who are best fitted for higher

command; (2) the insurance that officers so retained will reach the various grades at suitable ages; and (3) the insurance of a suitable flow of promotion. From an analysis of Table II it has been clearly shown that although the laws are basically correct in regard to selection and age in grade retirement in so far as they apply, the operation of the law in the future will be unsatisfactory owing to certain defects which have been pointed out and analyzed. How can these defects be remedied?

It is apparent that any satisfactory operation of the promotion and retirement laws depends on obtaining a correct ratio between four main elements. These are:

(a) The authorized percentages in grades;
(b) The ages for attaining each grade;
(c) The length of service in each grade;
(d) The number of forced retirements in each grade.

Here is a four cornered problem that requires, for its solution, certain compromises. By this is meant, we cannot have each of the four elements at its best, because the best for one may be not so good, or the worst, for the other, and vice versa. For example the number of forced retirements in any grade is dependent on the number authorized in grade and the number of years' service in that grade; while the number of years' service in grade depends on the age in grade retirement, and the number authorized in that grade; and so on, and so on.

The Authorized Percentages in Grade

In order to solve the problem, the first essential is that the number of officers in each grade should be in accordance with the naval duties to be performed. The percentages which are now authorized do not permit of sufficient officers in the grades of commander, lieutenant commander, and lieutenant. In each case where this situation exists, a certain number of officers in the grades next below must perform the duties of the higher grade, and assume the corresponding responsibilities, without receiving either the rank or emoluments that rightfully belong to the duties performed.

It is not intended here to go through the long process of reasoning and figuring by which the conclusions were reached that

the percentages now authorized should be changed in accordance with the following:*

TABLE III
Percentage in Grade

	At present authorized	*Proposed*	*Change*
Rear Admiral	1	1	0
Captain	4	4	0
Commander	7	8	+1
Lieutenant Commander	14	18	+4
Lieutenant	32.5		
Lieutenant (j.g.)		69	−5
Ensign	41.5		
	100	100	

*See, "A Study of Our Navy Personel Situation," U. S. NAVAL INSTITUTE PROCEEDINGS of August, 1921.

It will be noted that the only recommendations are:

(1) An increase of one per cent in the grade of commander;

(2) An increase of four per cent in the grade of lieutenant commander;

(3) The lumping of the total percentages authorized in the grades of lieutenant, lieutenant (j. g.), and ensign.

The first two are due mainly to the great increase in our destroyer force after our present allowances were calculated.

The last change is required to insure a proper flow of promotion through these three lower grades, which flow is not provided for in the present law owing to the seniority rule with no forced retirement. As we have concluded that promotion by seniority should continue in these lower grades, and be augmented by selection out, this lumping of percentages is necessary as one of the factors that will secure the proper flow of promotion through them.

THE AGES FOR ATTAINING EACH GRADE, AND LENGTH OF SERVICE IN EACH GRADE

The age in grade retirement provisions which require captains, commanders, and lieutenant commanders to retire on reaching

the ages of fifty-six, fifty and forty-five resepectively, will eventually result in most officers not being promoted to the grades of rear admiral, captain, and commander until they attain the ages of fifty-five, forty-nine and forty-five. At the same time, these ages fix the average length of service for captains at six years and for commanders at five years. In combination with the authorized percentages in grades, and the lack of provision for forced retirements in the grade of lieutenant, the average length of service in grade for lieutenant commanders will be slightly under four years. These short periods of service in the upper grades result in the long periods of eight and a half years and seven and a half years in the grades of lieutenant and lieutenant (j. g.) respectively.

'There should, of course, be some regularity in the length of time that officers serve in each grade. At the same time, this service should be performed while the officers are at the ages for most efficiently carrying on the duties and responsibilities that rightfully go with these grades. It is evident that the stipulations of the present laws do not provide in all cases for proper ages in grade and length of service in grades, but on the other hand, do just the contrary.

The average age of fifty-five is suitable for captains to be promoted to rear admirals. This is now fixed by the requirement that captains retire on reaching fifty-six years. Therefore, no change in this provision of the law is recommended.

But the ages of forty-nine and forty-four respectively, for attaining the ranks of captain and commander are manifestly too old. In addition, these ages do not permit adequate length of service in these grades. It is held that commanders should be promoted to captain by the time they are forty-seven and lieutenant commanders to commanders by the time they are forty. In order to do this the requirement for age retirement in the grade of commander should be reduced from fifty years to forty-eight years, and in the grade of lieutenant commander from forty-five years to forty-one years. These changes will fix the average length of service in the grades of captain and commander at eight and seven years respectively instead of six and five years as at present provided.

The law which requires lieutenants (j. g.) to serve not less than

three years in grade before being eligible for promotion should be changed so that, if qualified, they will be promoted on completing three years' service in grade. Changing the retiring ages in the upper grades and lumping the authorized percentages in the lower grades, together with a certain amount of elimination in these grades, will result in fixing the average length of service in the grades of lieutenant commander, lieutenant, lieutenant (j. g.) and ensign at seven, six, three, and three years respectively, instead of four, eight and one-half, seven and one-half, and three years as the operation of the present law provides. With this change in the length of service will come the corresponding change for the better in the ages at which officers will reach the various grades.

The differences between what the operation of the present law will eventually result in, and the proposed changes, are summarized in the following table:

TABLE IV

	Average ages for attaining the various grades		Average length of service in grades.	
	Present Law	Proposed Change	Present Law	Proposed Change
Rear Admiral	55	55	8½	8½
Captain	49	47	6	8
Commander	44	40	5	7
Lieutenant Commander	40	33	4	7
Lieutenant	31½	27	8½	6
Lieutenant (j.g.)	24	24	7½	3
Ensign	21	21	3	3

THE NUMBER OF FORCED RETIREMENTS IN EACH GRADE

The average annual number of forced retirements and casualties in each grade is fixed by the ratio between the number of officers in the grade and the average length of service in that grade. That the changes recommended will result in a much more reasonable and satisfactory result in this respect than the present laws will produce can be seen from the comparison given in the following table:

TABLE V

Annual Average Number and Percentage of Forced Retirements

	Present Law		Proposed Change	
	Number	Percentage	Number	Percentage
Rear Admiral	6.5	11.8	6.5	11.8
Captain	23.5	10.7	13.5	6.1
Commander	28.5	7.4	22.0	5.0
Lieutenant Commander	92	12.0	48.0	4.8
Lieutenant	0	0	31	1.6
Lieutenant (j. g.)	0	0	15	1.6
Ensign	0	0	15	1.6

It is seen from this that the recommended changes make a much more equitable, and therefore satisfactory, distribution of the forced retirements than does the present law.

For the junior officers who are selected out, there must be some arrangement made for their future. There are two alternatives:

First, to place them on the retired list with pay equal to two and five-tenths per cent per annum of service, as is now the provision of law for the upper grades.

Second, to discharge them from the service with a lump sum, as is now provided by law for excess graduates from the Naval Academy for whom there are no vacancies.

If these young officers are retained on the retired list they not only will be a continual drain on the treasury for which the Government will get no return (other than the possible employment of the officers in case of war), but there will be kept within the service a number of officers who are the least desirable, and who will keep their grievances within the service also. These officers will have received an excellent education in return for which they will not have discharged their indebtedness to the Government. They will not have had sufficient service to entitle them to a life long pension.

Should they be placed on the retired list with pay equal to two and five-tenths per cent per year of active service, this compensation would be so small as possibly to place the young officers in a position of serious financial embarrassment. It is, therefore,

TABLE VI

SUMMARY AND COMPARISON OF EVENTUAL OPERATION OF PRESENT LAW AND OPERATIONS IF PROPOSED CHANGES ARE ADOPTED

	1		2		3		4		5		6		7		8		9	
	Authorized percentages in grade		Number in each grade based on total of 5,499		Average age on attaining grade		Number of years in each grade		Annual number of vacancies that must be made		Annual number of forced retirements plus casualties		Annual loss due to 3% casualties		Annual average number of forced retirements		Annual percentage of forced retirements	
	Present	Proposed	Present	Proposed	Present	Proposed	Present	Proposed	Present	Proposed	Present	Proposed	Present	Proposed	Present	Proposed	Present	Proposed
Rear Admiral	1	1	55	55	55	55	8¼	8¼	6½	6½	8	8	1.5	1.5	6.5	6.5	11.8	11.8
Captain	4	4	220	220	49	47[2]	6	8	37	28	30	20	6.5	6.5	23.5	13.5	10.7	6.1
Commander	7	8	385	440	44	40[2]	5	7	77	63	40	35	11.5	13.0	28.5	22.0	7.4	5.0
Leiutenant Commander	14	18	770	990	40	33	4	7	192	141	115	78	23.0	30.0	92.0	48.0	12.0	4.8
Lieutenant	32.5		1787		31½	27	8½	6	210		53.5		53.5		0		0	
Lieutenant (j.g.)	41.5	69	2282	3794	24	24	7½	3	217	316	68.5	175	68.5	114	0	61.[3]	0	1.6
Ensign					21	21	3	3										
TOTALS	100	100	5499	5499			42½	42½			315[1]	316[1]	164.5	165.0	150.5	151.0	2.7	2.7

[1] Net annual increase required from Naval Academy and all other sources.

[2] Based on forced retirement ages in grades of captain, commander and lieutenant commander, fifty-six, forty-eight, forty-one, respectively.

[3] Discharges by selection *one*.

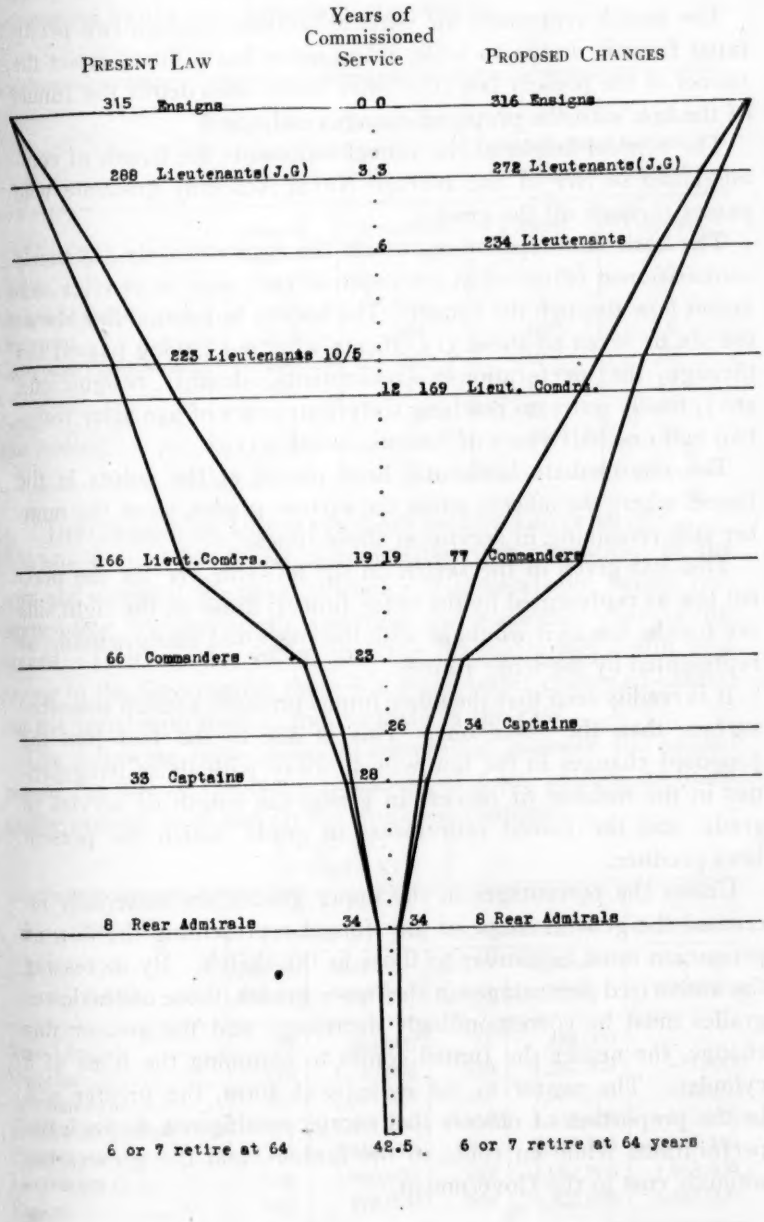
concluded that instead of placing them on the retired list, they should be given a lump sum, and discharged.

The composition of the board of officers who are to recommend such discharges need not be the same as that now provided for selection up in the higher grades. However, it is believed that in order to insure mature judgment, the membership of the board should be limited to officers not below the grade of captain.

In order clearly to place before the reader in concentrated form the results of the foregoing arguments the following table is inserted. This shows a comparison of the eventual workings of the present law with the operations that will take place should the changes recommended herein be adopted.

In this summary it is seen that the total number of new officers that must be commissioned as ensigns each year in order to maintain a strength of 5,499, is practically the same for the present law and for the proposed changes. This number is 315 in one case and 316 in the other. In any combination of the four essential elements that may be made in order to obtain satisfactory promotion and retirement, the progress of the individuals concerned can be likened to the flow of water through a perforated funnel where a large quantity is poured into the big end and only a limited amount comes through the small end, the remainder passing through the perforations.

We have here a situation where over three hundred young officers are poured into the top of the funnel each year, and at the end of forty-two and one-half years of commissioned service there are only six or seven who come out at the small end on reaching the retiring age of sixty-four years. The accomplishment of this in accordance with the present law, and for the herein suggested changes in the law, is diagramatically shown in the accompanying sketch.


Years of Commissioned Service
PRESENT LAW
PROPOSED CHANGES
315 Ensigns
0 0
316 Ensigns
288 Lieutenants(J.G)
3 3
272 Lieutenants(J.G)
6
234 Lieutenants
223 Lieutenants 10/5
12
169 Lieut. Comdrs.
166 Lieut.Comdrs.
19 19
77 Commanders
66 Commanders
23
26
34 Captains
33 Captains
28
8 Rear Admirals
34
34
8 Rear Admirals
6 or 7 retire at 64
42.5
6 or 7 retire at 64 years

Explanation of Sketch

The sketch represents the vertical sections through two perforated funnels drawn to scale. The outer heavy lines depict the funnel of the present law; the inner heavy lines depict the funnel of the law with the proposed changes embodied.

The vertical height of the funnel represents the length of commissioned service of the average Naval Academy graduate who passes through all the grades.

The horizontal top line represents the approximately 315 newly commissioned officers that are required each year to provide sufficient flow through the funnel. The bottom horizontal line shows the six or seven of these 315 officers who, not having passed out through the perforations, (retirements, deaths, resignations, etc.), finally retire on reaching sixty-four years of age after forty-two and one-half years of commissioned service.

The intermediate horizontal lines placed at the points in the funnel where the officers attain the various grades, show the number still remaining in service at those times.

The data given in the sketch on the left side are for the present law as represented by the outer funnel; those on the right side are for the law as it would be with the suggested changes made, as represented by the inner funnel.

It is readily seen that the inner funnel presents a much smoother surface than the outer one. This is due to the fact that the proposed changes in the law will do away with those irregularities in the number of officers in grade, the length of service in grade, and the forced retirements in grade, which the present laws produce.

Unless the percentages in the upper grades are materially increased the general shape of any funnel representing the flow of promotion must be similar to those in the sketch. By increasing the authorized percentages in the upper grades, those of the lower grades must be correspondingly decreased, and the greater this change, the nearer the funnel comes to assuming the form of a cylinder. The nearer to the cylindrical form, the greater will be the proportion of officers that escape passing out through the perforations while en route to the bottom, and the greater the ultimate cost to the Government.

The table below gives the comparative flow of promotion as represented by the two funnels in the sketch:

TABLE VII

	Number of officers who reach each grade		Total number of years commissioned service on reaching each grade	
	Present	Proposed	Present	Proposed
Ensign	315	316	0	0
Lieutenant (j.g.)	288	272	3	3
Lieutenant	223	234	10½	6
Lieutenant Commander	166	169	19	12
Commander	66	77	23	19
Captain	33	34	28	26
Rear Admiral	8	8	34	34

DIFFERENCE IN ULTIMATE COST TO THE GOVERNMENT

While it may be clearly demonstrated that alterations in the laws are essential for naval efficiency, it is necessary, before recommending legislation, to ascertain the economic changes involved. If it can be shown that the proposals will result in a saving to the Government there is a much better chance of obtaining the legislation than if the contrary is the case.

The following table shows a comparison between the annual pay of the line of the Navy composed of 5,499 officers, as based on the present laws and on the proposed changes:

TABLE VIII

Grade	*Present law*		*Proposed changes*		*Difference $*
	No. in Grade	Annual pay $	No. in Grade	Annual pay $	−savings +losses
Rear Admirals	55	384,000	55	384,000	
Captains	220	1,320,000	220	1,287,000	−33,000
Commanders	385	2,057,825	440	1,989,250	−68,575
Lieutenant Commanders	770	3,671,500	990	4,338,625	+667,125
Lieutenants	1787	5,950,710	1897	4,818,380	−1,132,330
Lieutenants (j. g.)	1630	3,960,900	949	1,992,900	−1,968,000
Ensigns	652	978,000	948	1,422,000	+444,000
Totals	5499	18,322,935	5499	16,232,155	−2,090,780

This shows that in pay of the active line alone, the Government would save $2,090,780.00 annually. This great saving is due in the main to the provisions of the proposed changes which would fix the average length of total commissioned service in most of the grades somewhat below the present requirement. This in turn makes the average pay of the officers in those grades correspondingly less.

But this pay is only one of the elements to be considered in ascertaining the total net profit or loss. The other elements are: (1) the allowances (quarters and rations); (2) the pay of the retired list; (3) the lump sum paid to those officers who are discharged.

Although the proposed changes would result in a great decrease in the actual pay, it is found, by following the same method of figuring, that the allowances under the proposals would result in an increased annual expenditure of $189,940.00.

The effect of changes in the laws on the pay of the retired list is considered of the utmost importance by the legislators. We can assume, with sufficient accuracy, that there always will be approximately the same number of retirements due to casualties so long as the total number of officers remains the same. Therefore the cost to the Government in this respect is equal for whatever changes may be made. But the cost due to *forced* retirements varies, of course, with the numbers forced out. The following table shows a comparison of the annual retired pay of the officers who would be forced on the retired list by the present law, with that of the proposed changes.

TABLE IX

Grade	*Present*		*Proposed*		Annual saving by proposed changes
	Annual number forced retirements	Annual pay	Annual number forced retirements	Annual pay	
Rear Admirals	6.5	$ 39,000	6.5	$39,000	$.....
Captains	23.5	105,750	13.5	60,750	45,000
Commanders	28.5	104,480	22	75,350	29,130
Lieutenant Commanders	92	304,245	48	93,600	210,645
Totals	150.5	$553,475	90	$268,700	$284,775

It is seen from this that the proposed changes would result in saving to the Government $284,775.00 in the first year of their operation. This saving is cumulative, so that allowing for reasonable losses in the retired list, the annual saving to the Government ten years later would be over $2,000,000.00, which saving would continue to increase each year until a normal balance was reached between the active list and the retired list.

There is one feature of the proposals that would result in a greater cost to the Government than at present. This is the payment of lump sums to those lieutenants, lieutenants (j. g.), and ensigns who are selected for discharge. By fixing these sums at $2,000.00 for ensigns, $4,000.00 for lieutenants (j. g.), and $6,000.00 for lieutenants, the annual cost is computed as follows:

TABLE X

Grade	Approximate annual number discharged	Sum paid each on discharge	Total cost
Lieutenant	30	$6,000	$180,000
Lieutenant (j.g.)	15	4,000	60,000
Ensigns	15	2,000	30,000
Totals	60		$270,000

To summarize the foregoing we find that under normal conditions, the changes herein proposed would, in the first year, save to the Government the following amounts:

Pay of the Navy (Table VIII)	$2,090,780.00
Pay of the retired list (Table IX)	284,775.00
Total gross savings	$2,375,555.00

On the other hand these same changes would cost the Government an additional amount as follows:

For allowances	$ 189,940.00
For discharged officers	270,000.00
Total excess expenditure	$ 459,940.00

The difference between these gross savings and the excess expenditure is $1,915,615.00, which is the net *saving* for the Government the first year.

Owing to the savings in the pay of officers transferred to the retired list being cumulative, this annual net saving of nearly $2,000,000.00 gradually increases, so that ten years after the adoption of the changes recommended herein became effective the annual saving to the Government brought about by their adoption would be over $4,000,000.00.

Summary of Proposed Changes in the Law

As a result of the foregoing study the following changes in law are recommended:

1. The percentages in grade be changed so that there shall be: For each 100 officers:
   - One in the grade of rear admiral;
   - Four in the grade of captain;
   - Eight in the grade of commander;
   - Eight in the grade of lieutenant commander;
   - Sixty-nine in the grades of lieutenant, lieutenant (j. g.), and ensign.
2. Compulsory retirement be made:
   - (a) When any commander reaches forty-eight years of age;
   - (b) When any lieutenant commander reaches forty-one years of age.
3. That lieutenants (j. g.) be promoted to lieutenant on completing three years' service in grade.
4. That when the annual total losses from death, retirement, or resignations in the three lowest grades is less than 175, there shall be discharged on recommendation of a competent board, sufficient officers in these grades to make this total of 175. Each officer so discharged should receive a lump sum equal to $2,000.00 if in the grade of ensign; $4,000.00 if in the grade of lieutenant (j. g.), and $6,000.00 if in the grade of lieutenant.

Legislation to bring about these changes requires the enactment of a simple bill made up of two sections. The first section would provide for amendments to the three statutes which fix: (1) the percentages in grade, (2) the ages for compulsory retirement, and (3) the length of service in grade for lieutenants (j. g.).

The second section would provide for: (1) compulsory discharges in the three lower grades, (2) the compensation to be paid the individuals so discharged, and (3) the composition of the board charged with the selection of the officers to be discharged.

It should be borne in mind that these proposed changes are the result of working out a balance between the four elements as represented by: (1) the percentages of officers in grade, (2) the length of service in grades, (3) the proper average ages of the officers in the various grades, and (4) the forced retirements or discharges in the various grades. A change in any one of the recommendations set forth, without changing the other, will destroy the balance obtained. Therefore, if, for example, the percentages in grade are altered, the compulsory retirement ages must be altered also, and so on. Otherwise, a smooth and equitable flow of promotion will not be attained, and deleterious effects on morale and efficiency, which we wish to guard against, will be increased.

Conclusion

It has been shown that while the provisions of law which require selection up and age in grade retirement in the upper grades are basically sound, the future operation of the laws will not be satisfactory unless certain changes are made in the present authorized percentages of numbers in grades, and in the ages at which compulsory retirement becomes effective. It has also been shown that the law is defective in that no provision is made for eliminating that excess in the lower grades necessary to insure a proper flow of promotion in those grades.

In this study an endeavor has been made to show what the defects are and to recommend the changes necessary for successful operation of the laws. It is not held that the solution presented is *the best;* but it is believed to be an acceptable one of the many that might result from the solving of the four cornered problem which is involved.

There is one important point which the study has brought out, and which it is desirable to emphasize. This is that the fear of certain officers in the upper grades that they will not have a fair chance for promotion, purely on account of their position on the list, is unfounded. This, irrespective of whether or not the

changes recommended herein are adopted, as the phrasing of the law is such that the selection board is required by its oath to give these officers a fair opportunity. Therefore, if there is a lowering of morale on this score, it is not justified.

But there is just cause for depression in the ranks of the lieutenants, lieutenants (j. g.), and ensigns. This is because unless some such changes in the laws are made as this study indicates to be necessary, these officers will spend an abnormally long time in these lower grades, only to find a large percentage of themselves relegated almost immediately to the retired list on finally reaching the grade of lieutenant commander.

It is manifest that for the maintenance of the morale and efficiency of the naval service some changes in and amendments to the promotion and retirements laws are essential.

The changes proposed herein will provide:

(1) Increased efficiency throughout the naval service;

(2) Fairer and more just treatment for the individuals involved—both for those who remain on the active list, and for those who are retired or discharged.

(3) Considerable financial saving for the Government.

Therefore, the sooner the changes are made, the better.

NAVAL AVIATION TODAY

By Lieutenant Frank W. Wead, U. S. Navy

Editor's Note: The importance of aircraft for use in conjunction with the fleet is everywhere recognized. The present article is the third in recent months covering the types, mission, and employment of heavier-than-air machines. While separately prepared, the three articles, nevertheless dovetail into each other and fit together so that they may well be considered as a whole.

Lieutenant Commander Ramsey, in the September issue, discussed material qualities of types with certain observations as to use. Lieutenant Commander Grow, in the March issue, discussed the general employment of formations and tactical principles governing battle doctrine. Lieutenant Wead, in the present article, discusses the use of individual types with certain observations as to material and general doctrine.

The present article, therefore, links together the two preceding articles, and all three, taken together, fairly well cover individual types, the use of types, and general employment of air forces.

THE heated controversy of aircraft versus the battleship seems to have momentarily subsided. We may rest assured that radical proponents on both sides are ready and willing to move into verbal action whenever an opportunity presents itself. The naval view which is almost universally held throughout the service is briefly this, "The airplane is a necessary aid and adjunct to the operation of the battle fleet, and is in no way a substitute for it."

The results of the joint Army and Navy bombing of ex-German and obsolete United States' ships off the Chesapeake Capes in June and July, 1921, and similar experience here and abroad strongly sustain this belief. In view of the nation wide interest which this bombing and subsequent arguments concerning it aroused, it may be well to give briefly here the results and lessons learned from it. These are:

(1) The following vessels were sunk by bombs,

Submarine—*G-117*
Destroyer—*G-102*

Light Cruiser—*Frankfort*
Battleship—*Ostfriesland*

(2) The battleship is still the backbone of the fleet and the bulwark of the nation's sea defense, and will so remain so long as safe navigation of the sea for purposes of trade or transportation is vital to success in war.

(3) The airplane, like the submarine, destroyer, and mine, has added to the dangers to which battleships are exposed, but has not made the battleship obsolete. The battleship still remains the greatest factor of naval strength.

(4) The development of aircraft, instead of furnishing an economical instrument of war leading to the abolition of the battleship, has but added to the complexity of naval warfare.

The value of the airplane to the battleship is primarily a post-war development; its growth has been rapid and is now progressing and expanding each day. In the earliest stages of aircraft operation with the fleet many difficulties were met and many problems were solved. Not least of these was the fundamental necessity of soliciting the interest and co-operation of the Navy as a whole. With mediocre aircraft and engines, and with personnel working in an entirely new field, this pioneering was successfully accomplished. The fleet became convinced that aviation could actually render a service to it. It is true that even now individuals exist who fail or refuse to see a brilliant future for such work. A typical example is found in the type of person who feels that an admission that aviation has any future in the fleet is a direct reflection on the value or capabilities of other units of the fleet. Such an attitude is unsound and delays development. Such an individual refuses to admit as true the facts which actual performance and experience have proved. The first intimate association of aircraft with units of the fleet occurred through the development of aircraft spotting. This particular phase of aircraft operation has perhaps developed more rapidly than any other. There are, however, many other phases, some of major importance, others more or less minor. They will be discussed to a certain extent below.

At present, shortage of funds and lack of trained pilots and personnel place a definite limit upon the operations of fleet aircraft. Aside from delay in pushing the development of each

branch as rapidly as possible, it is now impossible to give to all units of the fleet those aviation facilities which have already demonstrated their usefulness.

Aviation is new. The problems of organization, material and methods which confront it are innumerable. Their solution rests not only upon the development of individual efficiency in each unit but also upon the relation of that unit to all other units of the fleet.

The war time functions of naval aviation will include:

(a) Patrol from shore bases.

(b) Special missions, such as escorting convoys; assisting in land operations; bombing shore bases, etc.

(c) Operations with the fleet.

(1) Observation (spotting).

(2) Defensive and offensive aerial fighting. Protection of ships against bombing or torpedo plane attack. Protection of our observation planes. All types of screening. "Ship straffing." Control of the air.

(3) Torpedo or bombing attack on enemy vessels.

(4) Scouting.

In order for fleet aircraft properly to execute their respective missions a thorough knowledge of the disposition of the fleet while cruising, during the approach and in action is required. Aircraft units must be familiar with the problems of the fleet and methods used in solving them. In a similar manner it is equally essential that fleet units clearly understand the methods of operation, and the possibilities and limitations of aircraft units.

Many questions arising in connection with the operation of fleet aircraft can best be solved by officers of the fleet in conference with aviation officers. In any given situation, how, when and where should each aircraft unit be utilized? In attacking, what portion or unit of the enemy fleet should be selected? When action is imminent should torpedo or bomb attacks be launched before or after contact? These and many similar questions must be answered before aircraft doctrine can be set down. The solution of properly framed problems on the game board by experienced officers, who are thoroughly familiar with fleet and aircraft operations, should be a long step in the right direction. Such problems in the past usually have not connected the various

types of aircraft units together and have not placed their operations in sufficiently close relation to a normal fleet operation.

In any discussion of fleet aviation the question of transportation naturally arises. If aircraft are to be an integral part of the fleet they must be prepared to move with it wherever it may go. The following means are available, and have at present been developed to a certain extent. Several of these methods are more or less makeshift arrangements, and are not entirely satisfactory or necessary for normal peace time operation. In time of war it is highly probable that they will be utilized, at least to a limited degree:

(a) *Carriers*—Specially designed to carry and operate aircraft from flying on and off decks; or to discharge aircraft from catapults and to permit them to fly on or to land alongside for hoisting in.

(b) *Any type of vessel*—Seaplanes to be hoisted in and out. Types and numbers of seaplanes so carried will vary widely with the type of vessel, from specially designed tenders, accommodating large numbers, to tugs or other small craft carrying but one. This type of operation requires seagoing, seaworthy airplanes of long radius, capable of keeping the sea and refueling in moderately rough weather. Such tenders may be fitted to hoist in only a few such seaplanes for emergency repairs, provided that seaplanes are developed having a sufficient degree of seaworthiness.

(c) *Any type of vessel of moderate size*—Airplanes or seaplanes on catapults. The peace time installation of catapults will naturally follow the lines of (1) working out installations on various types and classes of vessels, and (2) supplying the type of aircraft which is of greatest value to the war time operations of the fleet. This type of aircraft, i. e., observation, is also probably of greatest peace time value.

(d) *On turret ships*—On turret platforms. This method is limited to light aircraft having a large reserve power, probably to single seater fighters. The great disadvantage in carrying aircraft on turret platforms lies in the fact that they must be of the land type and must land in the sea, thus requiring overhaul after each flight, or must limit their operations to vessels close to the shore.

(e) *On submarines*—Limited to small aircraft, probably single seater observation and scouting planes.

Where a squadron is assigned to operate from ships, the organization or subdivisions of the squadron parallel the ship organization to which assigned. It is highly desirable for training, overhaul and practice that all units of such a squadron be based together on shore or on a carrier during a portion of the year. The organization of an aircraft squadron closely parallels that of a ship, with divisions, departments, etc. The flight officer directs the training, drills and operations while the gunnery officer is more of a material man and technical instructor.

In the discussion that follows, and owing to the present experimental stage of aircraft work, it has been necessary to eliminate many details of a secret nature. It may be stated, however, that naval aviation methods are gradually becoming standardized, that much experience has been gained from the work of the past three years, and that the issue of a comprehensive preliminary doctrine is not far distant.

Bombing

Bombing perhaps holds more interest for the layman than any other form of aircraft operations. This is partially due to the fact that the agitation for a separate air force, and the controversy of the airplane versus the battleship have centered around it. It is the one type of operation which is carried out on nearly identical lines by the Army and Navy Air Services.

The past records of bombing do not give a true indication of its actual possibilities. The percentage of hits which have been made in past tests from war time bombing altitudes has invariably been small. Bomb sights in use today are very inaccurate, and may be compared to the open sights formerly used on guns. Gyroscopic and pendulum stabilized sights are under development, which will be fitted with telescopes. The types of bombs best suited to various types of targets have been well determined and will soon be available for service use. The problem of bombing a moving vessel, which may be zigzagging cross wind, is an intricate one. Properly and accurately to determine the course and speed of the target and the force and direction of the wind, and quickly to set the resultant on the sight, bring the sight on the target and release the bombs, requires experienced, trained and permanently detailed personnel.

Owing to the low terminal velocity attained by bombs, they must rely upon explosive effect almost entirely for damaging the target. The bombing of obsolete battleships clearly demonstrated that large bombs, striking alongside such vessels, have sufficient mining effect to destroy their water tightness. The following paragraph from the report of the Joint Board is interesting:

> Aircraft carrying high capacity high explosive bombs of sufficient size have adequate offensive power to sink or seriously damage any naval vessel at present constructed, provided such projectiles can be placed in the water close alongside the vessel. Furthermore, it will be difficult, if not impossible, to build any type of vessel of sufficient strength to withstand the destructive force that can be obtained with the largest bombs that airplanes may be able to carry from shore bases or sheltered harbors.

Such bombers will also be able to operate from carriers, tenders or catapults with the fleet at sea.

There are two types of bombing: i. e., individual and salvo or pattern. In individual bombing each pilot sights and releases his bombs independently. In pattern bombing all bombs are released at once. The location of bombs in the pattern and the dispersion may be varied by varying the location of planes in the formation. Considering the probability of hitting and the size of the target, and the number of planes available, pattern size can be determined for each case which will insure the greatest destructive effect. The pattern size as thus determined, dictates the arrangement and distance between planes in the bombing formation.

Spotting bombs may be used and the results of previous releases should be noted. In time of war it is essential that bombers approach, release and escape as promptly as possible. For this reason circling the target several times is highly undesirable, and spotting bombs are, therefore, of doubtful value.

There are additional supplementary types of bombing which may be performed by bombing planes and at times by other types of aircraft. These include:

(a) Target illumination (flare dropping).
(b) Gas screen laying.
(c) Smoke screen laying.

These functions are of value primarily during action and again the fundamental necessity exists for so utilizing them as to

assist directly in the operations of the various surface units. Smoke or gas screens laid by bombs or other apparatus can quickly be thrown up at any desired point, where surface craft might be exposed to a too destructive fire. Smoke screens from aircraft will otherwise follow the same general principles as those from surface vessels.

The Approach

While en route from base or carrier to the objective, aircraft should utilize every possible means of concealment. Surprise is the essence of aircraft attack. Where heavy enemy fighting patrols are known to be protecting their fleet, simultaneous attack from various directions may insure that a portion of the attacking force will slip through unobserved. In clear weather, aircraft are less likely to become visible from surface craft if at their ceiling or if very low over the water. The question of audibility may be solved by mufflers, provided they can be developed without serious increase in weight or loss in power. In clear weather aircraft patrols protecting a fleet will probably maintain station at normal bombing altitude, say 10,000 feet. When possible an objective should be approached out of the sun. Fog, broken clouds, rain and darkness offer a decided advantage for aircraft in attacking an enemy fleet and it is under such cover that the value of these attacks should reach a maximum. The operation of aircraft at night has, heretofore, been limited to individual bombing, but as facilities develop and experience is gained, it is believed that many if not all of their normal day time functions can be carried on in darkness. In clear weather, torpedo planes should approach low over the water, and bombing planes should approach comfortably below their ceiling.

Defensive measures which will doubtless be encountered by aircraft are:

(a) *Fighting planes*—Regular daylight patrols over shore bases, harbors and fleets.

(b) *Anti-aircraft fire*—In passing over a known anti-aircraft area 10,000 altitude should be maintained. A flight may pass through such an area by watching the bursts and changing course in advance of anticipated shifts in the zone of fire.

(c) Splash barrage or broadside shrapnel barrage during low torpedo plane approach. Against a fleet torpedo plane attacks should be delivered so vigorously and so rapidly that time does not exist for an actual barrage to be set up.

(d) Rifle and machine gun fire may be encountered when necessary to pass close to enemy vessels. It should be returned by our aircraft.

For defending our own aircraft we must rely upon—

(a) Mutual defense of planes in formation.

(b) Escort of fighting planes.

(c) Concealment and position.

Torpedo Planes

Torpedo plane methods, the use of the director, etc., have been drawn largely from past destroyer experience. In some instances the problem is not exactly similar and hence variations occur. Torpedo planes can approach so rapidly and closely before launching that nearly all attacks will be delivered at close range. Hence a much larger percentage of accuracy should be obtained. For this reason aircraft will normally fire at single units in an enemy formation rather than at the formation as a single target. Torpedo planes require a low position, ten and twenty feet, for launching, and a long low run gives an excellent opportunity to set the director and to launch as the sighting wires come on.

The proper selection of target ships for torpedo plane attack involves:

(a) Material loss by actual sinking or damaging enemy vessels, and

(b) Derangement of the enemy formation with consequent loss of efficiency in fire control.

Under any particular situation certain enemy units, such as aircraft carriers, tactical mine layers, etc., the elimination of which may be particularly desirable, may become very obvious targets for torpedo plane attack.

Salvo methods of torpedo fire are readily adapted for use with aircraft. It is considered, however, that the destructive effect should be distributed as much as possible; at the same time con-

centrating sufficient strength on each target to insure crippling damage. At present it appears that torpedo planes should attack capital ships in units of three. Against lighter vessels units of two or even one may be used. In following a retiring enemy fleet, torpedo planes may attack even capital ships singly, as slight damage will probably cause them to be delayed sufficiently to fall behind into the hands of our destroyers or other pursuing craft. The considerations of track angle, range, and errors in estimating enemy course and speed have as much significance to torpedo planes as they have to destroyers.

Scouting

Scouting is a function of all types of aircraft, although certain units will be assigned that duty as a primary mission. Torpedo or bombing planes in proceeding to attack, observation planes in proceeding to their station, etc., must scout in order to locate the enemy, unless the location has previously been definitely determined. Aircraft are particularly well suited for scouting owing to the large areas which can be covered in short periods of time and to the increased visibility at high altitudes. Continued observation by aircraft in clear weather will assuredly result in detection of the aircraft and in their being driven off by enemy fighters. In bad weather or above broken clouds or fog continued observation may be carried on without detection.

For successful fleet operation of aircraft, accurate navigation is essential. The methods, problems and material used are entirely similar to those used for shipboard navigation. Navigation on normal flights is so simple that the tendency is to neglect this all important subject.

Scouting planes, particularly when used in screening or on coastal patrol work, may carry bombs. The amount of bombs so carried, shortens the radius of the aircraft by eliminating an equal weight of gasoline.

Certain and prompt radio communication is a prime necessity in all aircraft work. This is particularly true if the full value of scouting aircraft is to be realized. The methods used in scouting will doubtless parallel those used by surface craft, with modifications directed by the characteristics and limitations of the type of aircraft available. Aircraft will also prove of great

value in screening, both independently and in direct conjunction with surface craft. This function includes:

(a) Preventing the launching of enemy aircraft from carriers, etc.
(b) Destroying or containing enemy scouts, particularly aircraft or small units. "Ship straffing."
(c) Informing our main body of enemy movements in ample time to permit of proper counter disposition.
(d) Defending our forces against torpedo or bombing attack.
(e) Destroying enemy submarines.

Fighting

Fighting planes are high powered, single or two seater, very maneuverable planes of high speed, rapid climb and high ceiling. They are equipped with machine guns, synchronized to fire through the propeller, and in the case of two seaters with a free gun aft.

The missions of fighting planes are:

(a) Protection of our fleet, bases, etc., against torpdeo plane or bombing attack.
(b) Protection of our torpedo and bombing planes en route to and during attack.
(d) Clearing the air of enemy fighting planes.
(e) Screening—attack on enemy airships and scouting or observation planes; denying information concerning our fleet.

Although certain definite and general principles may be laid down for fighting, it is in this phase of work that the experience, ability and initiative of flight leaders are of paramount value.

Concealment during the approach, attacking by surprise, concentration on an inferior force, and maintaining a superior position at slightly higher altitude than the enemy are the general principles of aerial combat. In actual fighting every effort is made to get within range with guns bearing on the enemy from such an angle that he either cannot see or cannot return the fire of the attacking plane. To obtain such a position may require some moments of maneuvering, and with pilots of equal skill in

equally matched airplanes, it may never be obtained. Once obtained it can usually be retained for only an instant. The aiming and firing of a fighting pilot must be instinctive. It can readily be seen that if opposing flights are paired off plane for plane, a superiority of even one plane on either side is a tremendous advantage.

Bombers, torpedo planes, scouting planes and fighters all have different gun locations, visibility and fighting characteristics. All of these must be thoroughly known and taken advantage of by fighting pilots in attacking.

"Ship straffing" may develop as a function of fighting planes, though probably only against lighter types of vessels where considerable personnel are exposed on deck during action.

Spotting (Observation)

With the use of aircraft in connection with the control of gun fire, the vision immediately appears of fleets firing at each other with accuracy and while invisible because of distance, smoke, fog, etc. This vision is not far fetched, is even now realized in part, and should be completely practical within a very few months.

A detailed discussion of observation methods, material, etc., is not possible here. The value of this phase of naval aviation is well known to the fleets which have used it.

Airships and Balloons

The *Shenandoah* has recently attracted the attention of the nation to rigid airships. Germany's success with this type during the war demonstrated very clearly its possibilities.

The fundamental characteristics of rigids, i. e., great radius, fairly high speed, and their ability to carry heavy loads and to hover, render them particularly well suited for certain uses. These functions are:

(a) Reconnaissance and scouting.
(b) Prolonged observation.
(c) Trans-oceanic escort.
(d) Antisubmarine patrol.
(e) Coastal patrol.
(f) Mine field searching.

(g) Carrying heavier-than-air craft.
(h) Transporting material and personnel.
(i) Bombing.
(j) Fleet control.
(k) Communicating with detached and distant expeditions.

Rigid operation is a new art in the United States. The success of the *Shenandoah* and the not far distant completion of the *ZR-3* insure that before long an actual opportunity will be given to judge the value of rigids in operating with the fleet.

The use of kite balloons in spotting and observation has several inherent disadvantages:

(a) Visible at great distances.
(b) Difficult to handle and operate.
(c) Dangerous in a high wind.

Heavier-than-air craft have become so firmly established in fire control that it is doubtful if future wars will see kite balloons with the fleet, except in abnormal circumstances.

Formations and Maneuvers

Formation flying is necessary for:

(a) Mutual protection of aircraft.
(b) Concentration of fighting, bombing and torpedo strength.
(c) Training of pilots.
(d) Bombing patterns.
(e) Easily transmitted signals, and co-ordination of units.

Certain formations are used by all types of squadrons, others are used only by a specific type or for a specific purpose. These formations and distances, intervals, and positions therein are standardized to insure uniformity. The methods of maneuvering, changing formation, etc., are also standardized in much the same manner as are movements of ships in formation.

Until the radiophone is sufficiently developed to a point of reliability for interplane communication, visual hand signals, or signals given by certain movements of the leading aircraft, must be used. Many maneuvers, however, can be promptly executed with safety without signal.

The basic principle of defense in any formation, and particu-

larly in standard "V" is briefly that the gunners of planes in one wing can protect the blind spots of planes in the other wing.

Where planes are based on catapults, or carriers, they, of necessity, take off singly. Hence, a rendezvous must be accomplished before proceeding on any mission. Such a rendezvous must be conducted in accordance with a definite plan, and with the time, place, and altitude definitely prescribed. Otherwise much time will be lost in needless "chasing."

Pilots

A serious shortage of trained pilots exists in the Naval Aviation Service. It is highly desirable that every officer have several years' experience as a pilot, progressing gradually to duty as a department head, executive, squadron commander, etc. This, of course, cannot exist for some years. The present age limit for training is thirty-one years. This should and ultimately will be reduced at least to twenty-eight. The requirement of two years sea duty after graduation and before being eligible for aviation duty must be met. Sufficient applications are not received for training to produce the desired number of physically qualified candidates for almost every new class at Pensacola. From June 1922 until June 1923, despite the fact that 100 aviators were trained, the losses due to transfer to sea duty, resignation, deaths, etc., so nearly kept pace with training that a net gain of only eleven was made.

It is essential that every possible encouragement be given young officers to apply for aviation duty.

Material

The vast amount of necessary experimental work and the rapidity with which advances are made in aircraft and engine design, render the material aspect of aviation particularly difficult. Airplanes are intricate structures, requiring careful design and construction of each part. It requires many months actually to produce a single aircraft of a new type. The parts of one type are not suited for use in another. As but a comparatively small number of each type is required, quantity production methods cannot be thoroughly applied. By the time an aircraft or engine is placed in service something better is usually available for pro-

duction, but must be delayed until existing supplies have been used up.

With the most thorough planning and construction possible, minor defects exist in newly built aircraft which show up only after continued operation. Such defects require modifications to be made in the aircraft in service.

Standardization of aircraft types, parts, etc., may in the future become practicable to a limited extent.

The entire material question is a mass of problems, requiring constant trial and correction before a solution is reached.

It is hoped that the brief discussion above will give an intimate view of a few of the problems and phases of aircraft units. One thing that is required above all else is the thought and assistance of officers of the fleet. Once the decision is reached as to how, when and where aircraft are to be used, definite plans can be laid down for the broader phases of fleet aviation operations.

A CHAPTER OF ANCIENT SEA POWER: THE MITHRIDATIC WARS[1]

By Julius W. Pratt, Asst. Prof., U. S. N. A.

THE Dardanelles and the Bosporus have always been a storm center of international politics. From that prehistoric day when the Greeks launched their thousand ships for the purpose—according to one school of writers—of wresting from Troy the commercial monopoly of the straits, to the autumn of A.D. 1922, when the British were massing army and navy to bar the crossing to Kemal Pasha, war after war has been waged for the control of these narrow waters. The reason is twofold. The straits are both barrier and passageway—a barrier to the transit from Asia to Europe, a passageway between the Black Sea and the Mediterranean. In the first capacity they have lain athwart the march of conquering armies; in the latter they have formed the crucial link in one of the richest of historic trade routes. It is not surprising then, that Rome in her march toward world empire, was called upon to fight a long and stubborn war for the control of these straits.

At the beginning of the first century B. C., when Rome was weakened at home by the strife of parties and party chieftains, by revolts of the slaves and lower classes generally, and finally by a formidable rebellion of her Latin and Italian allies within the peninsula, she was suddenly confronted without by a newly formed Black Sea empire, which threatened to destroy her rule not only in Asia Minor but even in Greece.

In 120 B. C., Mithridates Eupator, then a mere boy, came to the throne of the kingdom of Pontus, embracing an area of

[1] Sources and authorities: Appian, *Roman History* (translation by Horace White), Vol. II. Plutarch, *Lives* (translation by Langhorne), Vol. II (*Sulla* and *Lucullus*), Vol. III (*Sertorius*). Reinach, Theodore, *Mithridate Eupator, Roi de Pont* (Paris, 1890). Ebert, Max, *Südrussland im Altertum* (Bonn und Leipzig, 1921). Ferrero, G., *Greatness and Decline of Rome* (authorized translation), Vol. I. Mommsen, Th., *History of Rome* (translation by Dickson), Vol. IV.

plains and mountains in the interior of Asia Minor and a group of Greek trading cities along the south shore of the Black Sea near its eastern end. In the second and third decades of his reign Mithridates extended his territory or his influence over all the shores of the Black Sea, with the exception of the kingdom of Bithynia, a Roman protectorate lying between Pontus and the Bosporus, and of the rough northeast coast where the Caucasus mountains and their wild tribes stretched down to the shore.

Between 110 and 106 B. C., at the invitation of the Greek cities of the modern Crimea, which were hard pressed by the Scythian tribes, and upon the advice of Diophante, a Greek of Sinope, doubtless interested in the Crimean trade, Mithridates crossed the sea, defeated the Scythians in four campaigns, and annexed the Crimea as a vice-royalty of the kingdom of Pontus. He continued his conquests east of the straits (the Cimmerian Bosporus) and along the eastern shore of the Sea of Azov, and between the years 106 and 103 added to his territory the region of Colchis, an alluvial plain at the eastern end of the Black Sea and south of the Caucasus Mountains. In the 90's he extended his influence by means of alliances from the Crimea to the west and southwest, making allies of the Sarmatians and Bastarni between the Dnieper and the Danube, of the Celtic tribes in the Danube valley, of the mountain tribes of the Balkan Mountains, and the Thracians northwest of the Bosporus. Beyond Colchis also he extended his influence by an alliance with the Iberians and Albanians on the route from Colchis to the Caspian Sea.

The power that Mithridates had thus built up was not to be measured simply in territory or in population. In the Sarmatians and Bastarni he had secured some of the best troops of the East, the former supplying his army with light cavalry, the latter with heavy infantry. But in commercial and naval power his conquests and alliances were even more significant. The Crimea was a rich grain producing region which, in the flourishing days of Athens, had furnished that city with more than half of its importation of grain. The Sea of Azov was one of the richest fishing areas of antiquity and exported to Greece quantities of salt and dried fish. But in addition to the indigenous products of the country, it had formerly done a flourishing business in the exchange of Mediterranean products for those of the North and

CASPIAN SEA
ALBANIA
IBERIA
COLCHIS
CAUCASUS MTS
SARMATIANS
BASTARNI
BLACK SEA (EUXINE)
KINGDOM OF PONTUS
GREATER ARMENIA
PARTHIA
SYRIA
CAPPADOCIA
GALATIA
LYCAONIA
PAMPHYLIA
CYPRUS
BITHYNIA
ROMAN PROVINCE OF ASIA
THRACE
BALKAN MTS
AEGEAN SEA
CRETE
MEDITERRANEAN SEA
ADRIATIC SEA
ITALY
SCENE OF THE MITHRIDATIC WARS
88 to 64 B.C.

east. From Olbia at the mouth of the Dnieper, a trade route followed that river to its source and finally arrived at the Baltic. From Tanaïs at the mouth of the Don stretched two trade routes, one following the course of the river for a distance and reaching out to central Asia, the other crossing the steppes north of the Caucasus to the Caspian and thence via the Oxus (which in antiquity appears to have flowed into the Caspian[2]), the Hindukush passes, and the Kabul valley to India. In the Greek cities of the Crimea and the neighboring coast, grain, fish, hides and furs from the steppes, slaves, cattle, medicinal herbs, jewels, gold, and the wares of India and China were exchanged for the products of Mediterranean industry.

Another route to the Orient, yet shorter and cheaper than that across the northern steppes, led from Phasis on the coast of Colchis, up the Phasis river and across a short path to the valley of the Cyrus (the modern Kur) and thence to the Caspian. The use of this route was dependent upon the good will of the Iberians and Albanians who controlled the Cyrus valley, and this Mithridates had been careful to secure by one of his early treaties.

The Pontic cities themselves, Sinope, Amisus, and others less important, received a considerable overland trade from Armenia and even from Parthia, but their commercial situation was less favorable than that of Phasis in Colchis, or of Panticapaeum and Phanagoria on the Cimmerian Bosporus, Tanais at the mouth of the Don, or Olbia near the mouth of the Dnieper.

The great period of prosperity for the Greek cities of the Black Sea coast had extended through the fifth, fourth, and third centuries B. C. After the year 200 they suffered a serious decline. At about this time the Scythian and Sarmatian nomads began pressing in from the North, wasting the wheat fields and blocking the trade routes. After this time, too, the outlet from the Black Sea to the Mediterranean—the Bosporus and the Dardanelles—was increasingly uncertain. The second century was a period of adversity and decay among the Greek cities of the North, culminating in their appeal to Mithridates and the consequent surrender to him of their ancient independence.

To revive the ancient trade and the ancient prosperity of the Black Sea ports, and to enrich thereby both his subjects and

[2] Ferrero, I, p. 236.

himself, was evidently one of the bright dreams of Mithridates, and to this end much of his early policy was directed. His conquest of the Crimea and of Colchis gave him the termini of the most important trade routes. His treaty with the Sarmatian tribes reopened the Dnieper route to the Baltic, while his understanding with the Iberians and Albanians secured the best of all the roads to India. The arch was formed, but the keystone was still to place. Without a secure outlet to the Mediterranean the Black Sea was little better than a *cul de sac*, and the channel through which all this rich northern and eastern trade must pass to the western world was in the hands of Rome and of Rome's protégé, Bithynia. Bithynia, at the northwest corner of Asia Minor, controlled the eastern shore of the Bosporus; the Roman province of Asia controlled the eastern shore of the Dardanelles, while on the north and west Roman rule extended along the shore to Byzantium and the Black Sea. So long as Rome or a vassal of Rome controlled the straits, so long could Rome, at will, stifle the prosperity of the Pontic empire. To Mithridates the situation was intolerable, but until the Roman power was assailed at home by the Social War, he felt too weak to attempt a struggle. Encouraged by the Italian situation and furnished with an excellent excuse by Nicomedes of Bithynia, who, instigated by a Roman general, had invaded Pontus and closed the straits against Pontic ships,[3] Mithridates began the war with an irresistible invasion of Bithynia and the province of Asia (88 B. C.).

Plainly the war that now began would depend in large part upon control of the sea. For each side sea communications were vital. The chief field of military operations, as it turned out, was Greece, and in Greece neither Roman nor Pontic armies could be fed and maintained indefinitely save by reliance upon sea communications. Especially was this true of the Pontic force, most of whose food supply must be brought by ship from the far distant Crimea. Each side, it is true, had easily defended lines. Unless a Pontic fleet should sweep the Adriatic, Roman transports would ply between Italy and western Greece; unless a Roman fleet dominated the Ægean, Crimean grain would feed and Sarmatian infantry re-enforce the Pontic armies. But let either side obtain an overwhelming naval superiority, and its

[3] Appian, II, 12.

victory might seem assured. Indeed, if the Romans should ever secure the straits and dominate the Black Sea, the Pontic empire would fall to pieces of itself, for as in the case of the British empire, its many parts were held together by its fleets of commerce or of war. Pontus, Colchis, the Crimea, the regions of the Dnieper and the Danube had feasible contact by sea alone.

When war began, Pontic superiority at sea appeared secure enough. Mithridates' war fleet comprised 300 decked ships and 100 open biremes.[4] But behind the existing fleet was perhaps the greatest naval arsenal in the world. The Black Sea supplied every essential element of sea power. The Greek cities of Pontus themselves nourished a population experienced in seafaring, and to them was now added the Crimea with the splendid shipyards of its cities and its large seafaring population, while Colchis furnished an abundance of timber and naval stores. The only weakness was in a lack of men experienced in commanding and steering ships in battle, and this want was supplied by Phoenician officers. Finally, it must be remembered that Mithridates possessed enormous revenues. The Crimean region alone paid him an annual tribute of 270,000 bushels of grain and a large sum of money in addition.

Look, on the other hand, at the naval situation of Rome. When the war opened there was at Byzantium a small squadron under two Roman officers, but it was not a Roman squadron; it was supplied by Bithynia and the cities of Roman Asia. Rome, indeed, had no navy. After the fall of Carthage she had allowed her fleet to fall into decay and had been dependent upon Sicilian merchant ships to carry the legions to Africa in the war against Jugurtha. Furthermore, in contrast to the opulence of Mithridates, the Social War and the loss of the rich province of Asia reduced the Roman government to a condition of penury. The control of the sea by the Pontic navy appeared secure.

Dispersing or disregarding the innocuous squadron at Byzantium, the Pontic fleet swept through the straits and over the Ægean while the Pontic armies overran the whole of western Asia Minor; the two then combined for the invasion of Greece, finding a convenient base at Chalcis on the island of Euboea. This choice of a base is significant, indicating a confidence in the

[4] Appian, III, 17.

complete control of the sea; however, the fortunes of war might result on the mainland of Greece, the straits of Chalcis would lie between the Pontic base and the Roman armies. Most of the Ægean islands yielded to Mithridates or were taken by his forces; Athens and the greater part of Greece declared for him; Piraeus, the port and naval arsenal of Athens, became a base of operations for the Pontic fleet.

Meanwhile Mithridates had executed in Asia one of those terrible pogroms which have so often distinguished that unfortunate region. From Ephesus the order went out that on a given day all Romans and Italians in the cities of Asia, men, women, and children, should be put to death and their bodies thrown to the dogs. The order was faithfully executed, so great was the hatred of the natives for the tax-gatherers, the money-lenders, and the merchants of Italy, and from 80,000 to 150,000 are supposed to have perished. The measure had a variety of purposes; among other things it fell in with Mithridates' general scheme placing commerce in hands amenable to his rule.

The closing events of the Social War and the clashes of party strife at Rome had delayed energetic action till the year 87, when the Roman general, Sulla, at length found himself able to cross the Adriatic with a small army and begin the siege of Athens and Piraeus. Although the Pontic fleet had been unable to prevent his crossing from Italy, Sulla found the lack of a fleet a serious hindrance to his campaign. On the one hand, Piraeus could at any time be re-enforced or reprovisioned by sea;[5] on the other hand, Sulla's own communications were continually jeopardized by Pontic cruisers.[6] He plainly saw the necessity of a fleet, and after an attempt to get ships from Rhodes, which was blockaded by the enemy, he sent Lucullus, one of the ablest of his young officers, to raise a squadron where he could, and in the meantime opened shipbuilding operations in Greece.

Athens and Piraeus at length yielded to Sulla's persistent attacks. But the difficulty of his communications had reduced his army so near to famine that he was obliged to quit the rocky country of Attica, where his small army could best contend with the larger force and especially with the cavalry of the armies which Mithridates was now rushing into Greece, and to move

[5] Appian, V, 31, 32. [6] Ferrero, I, p. 99.

his army into the fertile plains of Boeotia, where indeed he could live on the country with better success, but where the Pontic armies would have every advantage in battle. "Most people," writes Plutarch, "thought this an error in his counsels, to quit the rocks of Attica, where horse could hardly act, and to expose himself on the large and open plains of Boeotia, when he knew the chief strength of the barbarians consisted in cavalry and chariots. But to avoid hunger and famine, he was forced, as we have observed, to hazard a battle."[7] The "hunger and famine" were plainly the result of the Romans' lack of a fleet. So evident was Sulla's plight that Archelaus, Mithridates' commander (perhaps knowing too that Sulla's enemies in Rome had passed a law depriving him of his command), preferred to avoid battle on land and to win the war by blockading the Greek coast;[8] but Mithridates tired of this passive policy and insisted on battle. The armies met at Chaeronea in March, 87. Superior generalship and superior discipline overcame the disparity in numbers, and the Orientals were routed. Not more than one-twelfth of their army of 120,000 men reached the base at Chalcis. Another great victory at Orchomenos in 85 practically cleared Greece of the enemy, and at the end of the year Sulla took up his winter quarters in Thessaly, where he set energetically about building a fleet for the invasion of Asia in the following year.

Mithridates meanwhile had been wasting his naval strength in a protracted effort to reduce the island of Rhodes, which remained loyal to Rome. The most skilfully devised measures of assault failed, and the Pontic fleet, though greatly superior in numbers, was worsted in a number of skirmishes with the Rhodians. For three years the blockade was maintained, the "war of attrition" meanwhile going slowly against the Pontic fleet. Then in the spring of 85 Lucullus with a small fleet slipped through the blockade and joined the squadron of Rhodes.

Lucullus' Odyssey had been long and laborious, says Reinach. He had left the Greek coast more than a year before with six small vessels, picked his way successfully through the Pontic cruisers, visited Crete and restored it to a "benevolent neutrality," fell foul of pirates, and reached Egypt at length almost alone. The Egyptian king declined to furnish ships for the war, but gave

[7] Plutarch, *Sulla*, p. 369. [8] Ibid., p. 369.

him an escort to Cyprus. Lucullus picked up a few vessels along the Phoenician coast, wintered in Cyprus, where he was joined by some Pamphylian vessels, and finally, cruising under sail by night and under oar by day to avoid discovery, he at length eluded the enemy and joined forces with the fleet of Rhodes. Thus re-enforced his fleet was formidable. He avoided a pitched battle but seriously annoyed his opponents by a *guerre de course,* ravaging the coast of Asia Minor and spreading counter-revolution. At his call the people of Cos and Cnidos expelled their royal garrisons and co-operated with him in an expedition against Samos. Chios was occupied. "The Roman squadron, breaking through the pass of Clazomene, debouched victoriously into the waters of Pitané, at the very moment when Mithridates, fleeing before Fimbria, shut himself up in that place, which then served as the port of Pergamos."[9]

The Romans were victorious by sea and land. While Sulla was crushing the invading armies in Boeotia, another Roman army under Flaccus, the commander sent out by the democratic party to replace Sulla, had operated independently to the northward and had reached Byzantium. Here Flaccus was murdered at the instigation of one Fimbria, a man of senatorial rank who had accompanied the army and who thereupon took command. Fimbria's army crossed into Asia Minor and put the king to flight as has been seen. Had Lucullus been willing to co-operate with Fimbria, Mithridates might have been taken and the war definitely ended then and here, but "the aristocrat in Sulla was stronger than the patriot";[10] he was unwilling to contribute to the glorification of a general of the opposing faction. Mithridates escaped to Mitylene, where he collected what remained of his forces—30,000 men and 200 ships.

Peace negotiations had for some time been in progress. Sulla, anxious to re-establish himself in Italy, was willing to make comparatively easy terms—the restoration of all conquests in Asia Minor and the islands, the surrender of seventy or eighty war vessels, the surrender of prisoners, and a moderate indemnity. Mithridates at first refused to meet these conditions in full, but the victories of Fimbria and the successes of Lucullus

[9] Reinach, pp. 199-200. Plutarch, *Lucullus,* pp. 418-421. Appian, VIII, 56.
[10] Reinach, p. 202.

made his position hopeless. Lucullus had won an engagement with the principal Pontic squadron in the waters of Tenedos and had occupied the Dardanelles, where he was re-enforced by the ships that Sulla had built in Thessaly. Thus Mithridates had lost control of the sea, and most important of all, of the Dardanelles. The Roman fleet in the straits had severed his line of supply, his line of re-enforcements, even his line of retreat. He could not regain Pontus by sea, and if he attempted a retreat by land, Fimbria's army stood in the way, while Sulla was now on the western shore of the Dardanelles whence with the aid of the fleet he could easily cross into Asia. Mithridates was in danger of destruction on both land and sea. Sulla, however, such was his anxiety to end the war, asked nothing beyond his original demands. Mithridates must perforce accept. Peace was concluded (84 B. C.) and, says Plutarch, "Mithridates sailed into the Euxine sea."

Perseverance, skill, and courage had created a sea power where none existed, and this sea power, if it had not won the war, had at least made possible the overwhelming character of the victory. We should expect that the lessons of this war would have taught the Romans the necessity of maintaining a navy, more especially since Mithridates still ruled the Euxine and commanded all its splendid naval resources, and must almost certainly, sooner or later, make a new effort to win the straits. But Rome had not learned this lesson. The fleet of Lucullus, most of which had been collected from allied states, was allowed to disperse. The reduction of Mytilene, which was to be punished for its adherence to Mithridates, required five years and was accomplished at length only through the borrowing of a fleet from Bithynia. The pirates of the eastern Mediterranean, who had long a flourishing business, had doubled in numbers and audacity under the encouragement of Mithridates, and now received important accessions from the dispersion of his forces as well as from the political refugees from the civil conflicts at Rome. Sulla abandoned the islands and the coasts of Asia Minor to these freebooters. The feeble efforts that were made to maintain a naval police were nullified by the dishonesty of the provincial governors and their agents. The notorious Verres, then quaestor in Asia, even sold to the agents of Mithridates a fine

sailing vessel which had been furnished by an allied city. The control of the sea, whch had been gained with such labor and had had such momentous consequences, was once more thoughtlessly abandoned.

Far different was the policy of Mithridates. After his defeat and the surrender of a portion of his navy, he was still strong enough to restore his power in the Crimea, which had revolted during the war. He set about building a new navy, and in its construction he profited from his recent experience. "His navy," says Plutarch, "was not equipped, as before, with gilded pavilions, baths, and delicious apartments for the women, but with all manner of weapons, offensive and defensive, and money to pay the troops."[11] At the outbreak of war in 74 B. C. the Pontic fleet comprised 400 triremes and quinqueremes and a countless number of transports and light vessels.[12] Furthermore, while Rome ignored the pirates, Mithridates knew how to use them. "He knew the art," says Reinach, "of maintaining with their principal chiefs, Cilician or Cretan, relations as useful and as unavowable as were at a later time those of the Most Christian King with the Barbary corsairs. This diplomacy was quickly to bear fruit. At the outbreak of war, the crews and vessels of the pirates came of their own accord to swell the royal fleet; the most renowned captains or *léstarques* commanded the squadrons of Mithridates, saved the life of the King and defended his fortresses."[13]

Mithridates further strengthened his diplomatic position by forming an alliance with Sertorius, a Roman general of the popular party who was heading a rebellion in Spain with the claim that his government, being representative of the people, was the true Roman government. By the terms of the treaty Sertorius agreed to confirm Mithridates in the possession of Bithynia, Paphlagonia, and Cappadocia, while the province of Asia was to remain Roman. Mithridates was to supply Sertorius with 4000 talents of silver and forty ships, and in return was to receive the services of a Roman general, Marcus Marius.

The immediate cause of the outbreak of the third[14] Mith-

[11] Plutarch, *Lucullus*, p. 423. [12] Reinach, p. 273. [13] Ibid., p. 313.

[14] The second Mithridatic war (83-81 B. C.) was a short affair, the private work of two Roman generals, and does not concern us here.

ridatic war was the annexation by Rome of the kingdom of Bithynia (75 B. C.), which not only made Rome the immediate neighbor of Pontus, but gave her complete control of the outlet of the Black Sea. Henceforth she could send her fleets into the Black Sea, or ruin the commerce of Pontus at her pleasure by blocking the straits.

Seeing the imminence of war and realizing that "the root of the evil [lay] in the neglect of their marine,"[15] the Roman government took steps to meet the situation. Cotta, one of the consuls, was dispatched to the Bosporus with what small fleet existed, to endeavor to hold the straits. Lucullus, the other consul, who was to have chief command in the East, was entrusted with over three million dollars for the tardy construction of an effective navy. Finally, no doubt with an understanding of the relations between Mithridates and the pirates, the Senate conferred upon Marcus Antonius extraordinary powers for clearing the sea of these corsairs.

The war opened auspiciously for Mithridates. Bithynia fell at a blow. At Chalcedon on the Bosporus, where Cotta unwisely risked a battle, the Roman army was driven into the town with great loss, and the Pontic fleet, storming the harbor, captured or burned the entire Roman squadron. The straits were open, and the Pontic fleet passed into the Sea of Marmora, whence two squadrons were detached, one to the aid of the Cretan pirates, the other to join Sertorius in Spain.

Meanwhile the Pontic armies advanced through Bithynia into the province of Asia. It will be recalled that Sertorius had refused to cede this part of Asia Minor to Mithridates—a serious point, since the power that held it held the Dardanelles. Mithridates remained apparently faithful to his agreement; on the capture of certain of the cities of the province, he allowed Marius, the general whom Sertorius had sent to join him, "to enter them with his rods and axes, and voluntarily took the second place as one of his train."[16] It is evident, however, that Mithridates had not lost sight of the importance of controlling the Dardanelles, for the cities he took possession of were those lying along the shore of the Sea of Marmora and the straits—Parium, Lampsacus, Priapus—and instead of being directly incorporated in the

[15] Mommsen, IV, p. 325. [16] Plutarch, *Sertorius*, p. 100.

pseudo-Roman domain of Sertorius and Marius, they were declared free cities and exempt from imposts and taxes.[17] Thus Mithridates sought to gain two ends: to secure a base on the coast for his operations in the interior of the Roman province, and to assure himself of the eventual control of the Dardanelles as well as that of the Bosporus.

But Mithridates' efforts in this quarter were doomed to failure. As he advanced into the interior to meet Lucullus, who was hastening up from the south, he found a country so impoverished by Roman misrule that it could not maintain his army, while the increasing distance from the sea coupled with the poor port facilities of the cities he had taken resulted in a breakdown of his commissariat. He was obliged to fall back upon the coast, where, to gain a port measuring up to his needs, he undertook the siege of Cyzicus. The city held out heroically, and Mithridates in his trenches was in turn besieged by Lucullus. The enterprise ended in disaster, and Mithridates withdrew by sea to the Pontic kingdom.

His success at sea was almost as short lived as on land. Marcus Antonius had been completely defeated in his attack on the Cretan stronghold of the pirates. Mithridates, who still controlled the straits, sent a portion of his fleet under Marius into the Ægean to co-operate with these irregular forces. Lucullus meanwhile had collected a considerable fleet from the allies of Rome. With this he followed Marius, caught his fleet in detail and destroyed it, and stationed a squadron of seventy ships in the Dardanelles to intercept the Pontic detachments returning from Spain and Crete.

This year (73 B. C.) marks the end of the sea power of Mithridates. The larger portion of his fleet, with numbers of transports, was destroyed by shipwreck while sailing homeward along the south shore of the Black Sea. The Roman fleet passed the Bosporus and from this time on dominated the Euxine.[18] The pirate power was destroyed by Pompey in 67 B. C., and the remainder of the Mithridatic war was fought out far from the seacoast, in Pontus and Armenia.

The dominant position of the Roman navy in the Black Sea is evident in the final acts of that romantic drama, the life of

[17] Ibid., p. 100.

[18] Ebert, p. 225.

Mithridates. In the year 65, defeated by the Romans and deserted by his ally, Tigranes of Armenia, he escaped across the mountains to Colchis, where he passed the winter in Dioscurias. The only part of his former empire where he could now hope for comparative safety from Rome was the Crimea; he resolved to rebuild there something of his former power. But the sea which had once swarmed with his grain ships and triremes was now so far in the power of the enemy that he had to hazard the overland journey. In the spring of 64 he plunged into the wilds of the Caucasus, where he either fought or bought his passage through the hostile and unconquered tribes, and finally by this route arrived at his destination. Pompey, who had succeeded Lucullus in command, made no effort to pursue him, but established a blockade,[19] and it is to the effect of this blockade upon the commerce of the Crimean people that one writer ascribes the final revolt which left to Mithridates no other course than suicide.[20]

The great trade routes of the Black Sea were meanwhile passing into the control of the victors. While Mithridates was nursing his last plans for revenge against Rome, Pompey, special representative of the Roman capitalist and merchant class, was leading an expedition from Phasis to the Caspian Sea. "Thence he returned into Lesser Armenia," says Ferrero,[21] "bringing back to the adventurous Italian merchants exact and welcome information about the mysterious overland trade route to India." The entire heritage of Mithridates passed, with the control of the sea, to the Roman conquerors.

[19] Ferrero, I, p. 236. [20] Ebert, p. 252. [21] Ferrero, I, p. 236.

PERSONNEL MANAGEMENT IN THE NAVY

COMMANDER D. E. CUMMINGS, U. S. NAVY

I. PERSONNEL MANAGEMENT A MAJOR DUTY OF EVERY NAVAL OFFICER

After a lecture at the War College on the "Psychology of the Soldier," the general comment was heard that the lecture was very good, but that it contained nothing new for a well informed naval officer.

". . . . sixty-one per cent recommend *more and better training in the art of handling men*—that is, better instruction in personnel management."

The above quotation from a recent address by the assistant Chief of the Bureau of Navigation is from a summary of recommendations as to means of reducing desertion in the Navy. It seems to be inconsistent with the comment on the psychology lecture.

There can be no doubt that the handling of men is a major duty of every naval officer. A navy *is* men. If the Navy is to be successful, the management of its personnel must be *adequate*.

When a high rate of desertion obtains, personnel management cannot be considered successful. Our rate of desertion is too high. Either the men supplied have not been good material, or their loyalty has not been obtained. Either cause is a result of inadequate personnel management.

Discontent, lack of trained men, absenteeism, lack of skill, failure to perform adequately the duties that need to be done, lack of cleanliness, lack of interest, lack of co-operation, indiscipline, all are symptoms of inadequate personnel management. It is comforting to lay the blame for these faults, when they appear, on Congress, or the poor quality of recruits, or an overloaded schedule; moreover such shifting of the blame is plausible enough, and has elements of justice in it—perhaps. However, it behooves us to remember that our job is personnel manage-

ment, and, if Congress and the recruiting officer and those mysterious high-ups that make schedules provide us with instruments such as we clamor for, we would be out of a job; the personnel would manage itself, and the need of officers other than a staff and a navigator, and a few other such, would disappear. It is in order to provide trained, intelligent personnel capable of getting results with such tools as are given them that we are educated and commissioned.

II. Training in Personnel Management

Personnel management being one of the principal responsibilities of our profession, and an art in the practice of which we are always engaged, it might be assumed that the subject would occupy a conspicuous place in the curriculum of the Naval Academy; and that means would be in use for familiarizing officers with such phases of the art as have been the subject of scientific study. Certain psychological phases, such as the psychology of the crowd and the psychology of adolescence (most of our recruits are still in the advanced stages of adolescence), would, perhaps, be looked for as common knowledge among officers; certainly a basic knowledge of individual, normal psychology and its special application to the naval environment. The methods of selecting men and training them for the numerous specialties of the Navy would be expected to evidence a working knowledge of the methods found useful elsewhere. The time and motion study, which is the basis of efficiency in many turrets and steel foundries and fire control stations and automobile factories, would surely be a common accomplishment among officers. Surely an organization, all of whose objectives are gained by the management of men, would leave no stone unturned to be foremost in the application and development of knowledge and method pertinent to such management.

A seeker after evidence of such knowledge and practice would not be wholly disappointed. Naval officers usually become more or less expert handlers of men by virtue of experience and necessity. Many traditions of the service guide away from dangerous errors. Scientific industrial management points with pride to our fire control management. And we do get results that are most creditable, not only occasionally, but frequently.

Yet we get them often times at a cost much of which is unnecessary. How many of our candidates for signalmen fail? How many for quartermaster? What per cent of our yeomen are unfitted to excel as such? Too many; and what labor we are put to training those that cannot learn, struggling to produce with willing but incompetent help. A certain amount of such trouble is inevitable; but a great deal of it is needless, if we but knew how to avoid it. And we should know, for that is personnel management, and personnel management is our business.

III. Need of Further Training

We have not had formal training at the Naval Academy in the sciences that pertain to personnel management. Too few of us are familiar with the results obtained by personnel managers outside the Navy, or with the methods by which they obtain their results. The experienced naval officers who commented on the War College lecture mentioned at the beginning of this paper averaged over twenty years of experience. At no time in their careers (with possible individual exceptions) had they been trained in any phase of personnel management except as their own experience had trained them in it. Accepting, if you will, that they had all become experts in the art, it is inevitable that such expertness had been attained at the expense of those on whom they experimented. What an aid it would have been to them had they been familiar with the experience of others; as in every other activity of life, their success would have been greatly enhanced had they started this career of leadership with a fuller understanding of men and methods.

An officer of our Navy whose name is illustrious the world over was unsuccessful as a personnel manager. His justly earned fame was gained aside from the immediate practice of his profession afloat. At the height of his career he lamented that no one had pointed out to him, at its outset, the essential importance of a knowledge of men; and that he had only failure and heartburnings to remember as a result of a lack of such knowledge and of a timely realization of its importance. Perhaps we may be grateful that his failure afloat led him to use his great talents otherwise to our eternal profit; but not many of us can hope to emulate him in that respect, and it behooves us, therefore, to see to it that we have not the same occasion to do so.

The art of handling men consists in doing those things which will cause the men to do what you want them to do, and in avoiding those things which will tend to prevent their so doing. The science of handling men consists of a knowledge of how to cause men to do what you want them to do, and what not to do in order to avoid any tendency to prevent their doing so. Science is the knowledge, art is its application. Since we practice the art daily, the science is of immediate and ever present practical value.

There is thus ample reason why every officer of the Navy should concern himself with those sciences which will assist him in the practice of the art of personnel management. But there is special reason why he should now bestir himself more even than before; for the matter is a very live one and recent steps portend great advances from a position of relative inaction to one that should ultimately put the Navy in the forefront. Those who take time by the forelock and make for themselves opportunities to become conversant with such knowledge will be in position to profit by this advance; while those who do not may find themselves greatly handicapped in the practice of their profession, and will certainly not be in a position to achieve the utmost that their abilities warrant.

IV. What is Being Done to Meet the Need

The need of better training in the art of handling men expressed in the quotation at the beginning of this paper is not being left unsatisfied. While in command afloat, the present Superintendent of the Naval Academy initiated a prize contest on the subject of handling men, as a result of which a number of excellent essays were submitted, several of which have been published in the *Naval Institute Proceedings*. More recently the Institute offered prizes for material and had prepared a textbook on the subject for use at the Naval Academy. An outline of knowledge of pertinent science will thus be available shortly, in practical form, and with particular reference to the immediate needs of the service. But no such textbook or course can hope or pretend to be exhaustive, or to do more than to introduce the subject of personnel management in some of its elementary aspects. To do so would require an extensive library covering in detail all the numerous allied activities from which aid could be gleaned.

The need of a fuller knowledge of personnel management is not confined to officers. Petty officers, and especially chief petty officers, are most immediately concerned in the practical, intimate practice of the art, and the Bureau of Navigation is preparing a course of instructions for them. There is no one class of personnel in the Navy whose leadership can produce more vital results than that exercised by the chief petty officers within the ship. Practical aid to them in employing the most productive methods of leadership will enable them to increase their individual and collective value to their ships and the service; and the same material should be of even greater value to junior officers who have not had the benefit of the long practical experience which has enabled the chief petty officers to obtain their advancement.

Especially will these courses of instruction be of value in familiarizing naval personnel with management methods and aiding them in their daily tasks, if the paramount importance of such knowledge and its application is officially stressed, and the use of available means of acquiring it is fostered. It is within the province of every commanding officer to do this, and most commanders fully recognize the need for such training in some form. There is ample evidence that responsible officers in the Department, commencing with the Secretary of the Navy, are very much alive to this need. If other evidence were lacking, the recent submission of the personnel management question to the General Board for study and recommendation would suffice. But there is ample other evidence of such interest. Specific methods of scientific selection and training of enlisted men with a view to increasing the efficiency of such selection and training and reducing the abuses which have necessarily accompanied the lack of such methods are actually in present use at the Training Station, Hampton Roads, and elsewhere. Many contributions to these methods have originated among officers afloat; and there cannot be too much emphasis laid upon the need for an understanding of such methods and their possibilities afloat, not only in order that those who are in closest touch with the personnel at work may be in a position to contribute a maximum to the development of naval personnel management, thus ensuring that such development will be closely adjusted to their needs, but also that they may be enabled to recognize and utilize the results which such methods offer.

V. What More Can Be Done

The Navy will advance in its personnel management in proportion to the knowledge acquired and interest maintained throughout the service. A few experts here and there can accomplish but little, and that slowly. If there are conspicuous examples of success it is because they stand out by contrast with a prevalent condition which should not exist. There are many things that an interested officer can do to further his own knowledge and ability in the art. The most important one is to keep everlastingly interested, to seek competent counsel, and to try and keep on trying. In the development of a technique of personnel management the use of case records would be of great assistance. Every officer can make such records, and he will find the writing down of his problem and his solution and its results a very stimulating and suggestive procedure. A case record is simply what its name implies, a record of a case. Such records should ultimately be standardized in form for use in comparison with other similar records, but until that has been done any convenient form will do. I have before me a case record consisting of a brief narrative entitled "Psychological Test for Adaptability for Radiomen." The history of this particular record is that it demonstrated the unreliability of the tests under consideration, and that it led to a successful search for better tests. The tests finally worked out have been perfected and are now in process of final test on a large scale at the Naval Training Station, Naval Operating Base, Hampton Roads.

Such records are useful for the officer who makes them. They are of great interest to others who are working toward the same ends. This is true whether the case is successful or not. If carefully analyzed for cause and effect, they demonstrate the value or lack of value of the means taken to produce the end desired. They tend to prevent loose thinking and to promote clear understanding. They focus attention on the meat of the problems. A case record might well be made on "How to assimilate most profitably a new draft of recruits"; or on "John Smith, a chronic liberty breaker"; or on "Reduction of mast reports." Honestly record what happens in the case, and follow it up until time has confirmed your conclusions.

There is much literature available that will shed light on problems and methods of personnel management. Broad reading along

such lines will open up many avenues of development. Certain specific phases of the work will be particularly aided by a reading of texts appropriate to those phases. There is too little such literature that bears directly on naval practice. It is necessary to adapt more general texts. I know of no better introduction to the subject of how to select men for training for special duties than Dr. Link's *Employment Psychology*. It gives an excellent, definite idea of the methods, possibilities, and limitations of practical selection tests, and has the added advantage of being very readable indeed.

During the war a great deal of constructive work was done by the Army along personnel lines, much of which was left uncompleted at the time of the Armistice. A record of the work done that will repay reading may be found in the two volumes of the *Personnel Manual, U. S. Army*, issued by the Government Printing Office. More directly applicable is Colonel Munson's book entitled *Management of Men*, which attempts in a most interesting manner to present personnel facts and methods in the light of military practice.

Scientific management in some of its phases offers many suggestions for the personnel manager; but, in applying the principles of scientific management it is necessary to use caution. Where they apply they are most practical and helpful, and there is a vast field in the Navy in which to apply them. But the Navy is interested in men who will find a way to produce no matter what happens, rather than men who blindly follow rules, however efficient those rules may be in producing the immediate result. Mechanical perfection in personnel management is a splendid servant, but a bad master. American character does not lend itself to systems which do not provide for taking advantage of the intelligence and initiative of all. The most perfect system will fail if it be based on what men should be and do instead of what they are and actually do. A system without a soul is worse than a soul without a system.

Educational institutions throughout the country offer many very practical opportunities for the study of subjects bearing on personnel management. It is a fact that many such institutions take pleasure in making available the means at their disposal which might serve the needs of naval officers. Sometimes evening lec-

tures and discussions are held. It will pay to find out, and to take advantage of such opportunities as may be presented during overhaul periods, or on shore duty. And there is always the Harrington Emerson Course in personal efficiency. All of these are of value, and some of them are always available.

A matter of such universal importance, now that the ball is definitely started rolling, cannot fail to go far and to influence powerfully the development of the Navy henceforth. Every officer must recognize the importance of it in his own work. Training of officers in personnel management has been so restricted that many will find it desirable to make a special study of it. Those who do so early and effectively cannot but take a leading part in such development. This influence can be exerted most beneficially to themselves and the service. Some means of gaining knowledge are available to every one. Better means will become more generally available as time goes on. No doubt postgraduate work in personnel management can ultimately be had. The Navy offers an unsurpassed laboratory for the study of it, for its application in the course of the day's work, and for facilitating that work and making it more fruitful. It is to be earnestly hoped that many will consistently endeavor to add to their knowledge of personnel management and will in due time reap the fruits of their endeavors.

WOLVERINE NÉE MICHIGAN—A BIT OF THE OLD NAVY

By Commodore E. B. Underwood, U. S. Navy, Retired

VERY shortly before the founding of the Naval Academy, there was built at Pittsburgh for the Government a small iron gunboat. She was named the *Michigan* and intended for service on the Great Lakes. To most people (count me in), statistics are never very interesting, so I will only say, briefly, that she was launched in 1844, that she was a paddle-wheel steamer of 685 tons displacement, with a mean length of 165 feet, beam twenty-seven feet and draft nine feet, that she was barkentine rigged, and that she was armed with six howitzers. Marvelous to relate, her complete cost was only $165,000.00.

I served in this craft some nine lustrums ago and was then told by one of the old-timers on board that, though built in Pittsburgh, she had been shipped by sections to Cleveland and there put together and launched. A somewhat hasty search through documents in the Naval Academy Library neither confirms nor contradicts this statement, but I believe it true, for the alternative would have been a long and roundabout cruise via the Ohio and the Mississippi Rivers, the Gulf of Mexico, the Atlantic Ocean, the St. Lawrence River, and Lake Ontario, and when the ship had reached the western end of the last named body of water, her paddle wheels would have had to be removed before she could pass through the Welland Canal and thus reach Lake Erie. At any rate she was on that body of water in 1844, and Erie, Pa., was made her "home port." For a great many years, she wintered in Erie and in summer cruised the lakes, from Buffalo at the foot of Lake Erie, on the east, to Duluth at the head of Lake Superior, on the west, visiting all of the larger American ports and many of the smaller ones, as well as a few on the Canadian side. I understand, however, that of late years her cruising has not been so extensive.

Having cruised the "unsalted seas" for sixty years as the

Michigan, the Navy Department, in 1905, took occasion to "rob her of her good name." The names of the states were wanted for the new battleships, and the dignified name of "Michigan" was given to one of them, while the gunboat became the more commonplace *Wolverine*.

With two fellow ensigns[1], I reported for duty on board the *Michigan* in July, 1877, and remained attached to her till the end of October, 1879. All three of us were much pleased with this detail, as the duty had always been considered very desirable and moreover it put us in the wardroom, a pleasant situation that did not fall to the lot of the vast majority of ensigns in those days.

I think it will be convenient to divide the *Michigan's* year into two periods—the stationary period and the cruising period. The former began in November when the ship was securely moored to her dock in Erie and stripped to her lower masts; then the portable roofing was broken out of the store house and the ship housed in, after which several stoves were set up, which, with the regular heaters below, generally furnished a fairly comfortable temperature.

Then set in a period of masterly inactivity. The crew, which numbered about one hundred, were, almost without exception, reliable, well-behaved men, many of whom served enlistment after enlistment on board the ship, a considerable number being married and having their families in Erie. It was, therefore, a matter of course that the watches should alternate with a day on board and a day ashore. One man who was asked the question as to what he was doing now by an acquaintance that he had evidently not seen for some time, was heard to reply, "I work on board the *Michigan!*"

As with the crew, so with the officers, most of the married ones joining their families in rented houses, while the few others established themselves in the old Reid House, then Erie's principal hotel. Immediately on going into winter quarters, watch standing ceased and the watch officers were allowed to go into day's duty. This gave each a day on and either two or three days off, according to the number available.

[1] The late Lieutenant Commander W. H. Schuetze, and the late Rear Admiral J. M. Bowyer, one time Superintendent of the Naval Academy.

The routine of the day required everybody to be on board for quarters at 9:30 in the morning, after which came a drill of some kind, followed by a period of chitchat in the wardroom. By 12:30 all the officers except the one who had the day's duty had taken their departure, and the watch entitled to liberty started as soon as dinner was over. Officers' messes were broken up, the meals for the officer having the day's duty being brought to him from the hotel by a wardroom mess attendant who transported them in a huge patent tin affair that really kept the food fairly hot. This officer had many lonely hours, for visitors were few and there was usually little on board to demand his attention. The commanding officer[2] did all he could to ameliorate the situation: he permitted us the use of his comfortable cabin whenever he, himself, was not on board, and he made the very liberal interpretation that the officer whose duty it was, would be considered "on board" as long as he was in sight of the ship. We were thus allowed to go skating in the vicinity of the ship or to take the ship's ice-boat out for a spin.

This privilege proved fatal a few years later to that fine fellow Tom Plunkett, of the class of 1871. Being out skating one day, he got onto some newly formed ice where ice cutters had recently been at work, and breaking through, was drowned.

Erie, in my time, was a modest place compared to the big, bustling city it has since become; there were no movies, of course, and really good theatrical companies appeared in the town only at rare intervals. The people were most hospitable and took a more than ordinary interest in the Navy, for during the long succession of officers attached to the ship, not a few had married Erie young ladies.

The winter climate was not the best in the world. State Street, the principal business thoroughfare of Erie, terminates in a long hill, at the foot of which the *Michigan* was moored. This hill was considered Erie's hottest stretch in summer and coldest in winter. In going from our quarters to the ship, we frequently had to encounter an "air" both unusually "nipping" and "eager," and sometimes had to plough through snow above our knees. When, therefore, the stationary period came to its close, some of us were not sorry.

[2] The late Commander G. W. Hayward.

The cruising period began in early April when the ship came out of winter quarters and preparations were made for the summer campaign. Then followed a cruise that lasted till November. We were compelled to make leisurely progress, the ship not having the speed of a destroyer; I never but once saw her attain ten knots, and that was in Lake Superior, with a strong wind on the quarter, and all sail set.

During the cruising period, we visited all sorts of cities, towns, and smaller units on the American side, and a few ports on the Canadian, and in nearly all found something to enjoy, of one nature or another. We always made a short call at the Canadian town of Sarnia, which is at the head of the St. Clair River, being opposite our own town of Port Huron. At Sarnia we laid in our wet sea stores, beer, wines and liquors, as well as tobacco, cigars and cigarettes being of good quality and considerably cheaper than on the American side. I remember on one occasion when I was going around with the caterer of our wine mess being shown by a dealer some whiskey that, if bought by the barrel, could be had for sixty cents a gallon. It was real whiskey but new, and we did not think highly of it. But now that "the hydrant-headed monster Prohibition" has come to dwell with us, it would no doubt, in this country, be considered a first class article and command a price many times sixty cents a gallon. Going through the Sault Ste. Marie Canal was always interesting and I remember once admiring two picturesque Indians, in scant costume, that were spearing fish in the rapids of the river near by. The scenery in Lake Superior was particularly beautiful being marred by the hand of man only infrequently and in isolated spots. Then, too, the climate was most bracing. As I remember, although it was mid-summer, we frequently found it expedient to sleep under two blankets. I have in mind some excellent fishing that we enjoyed on one of the shoals near the Apostle Islands (so called because they number twelve). The only disagreeable Lake Superior experience that I recall was on an occasion when we were caught for several hours in a dense smoke from a burning forest. We were debating the expediency of starting all hands singing the *Lux Benigna* when we ran out of the "encircling gloom." But all cruises must have an end and by early November we found ourselves back in Erie getting ready for another winter.

One or two of the personnel of the *Michigan*, I recall with unusual clearness. The first is Mr. Murphy, the pilot. The ship in her cruises was very rarely out of sight of land and then only for brief intervals. Therefore, there was never any regular navigator attached to her. Instead, the Navy Department allowed her two pilots, employed by the year at (I think) $1,200.00 each. Mr. Murphy was one of these, and a fine old Irish specimen of nature's nobleman he was. All the years of his active life, except the Civil War years, he spent in the *Michigan*. When the Civil War broke out, he went "below" (as salt water was known locally) and served with Jouett in the *Metacomet*, returning to his old job on board the *Michigan* right after the war. A short time after I joined the *Michigan* and before I knew anything about his previous service, I one day asked him how long he had been in the ship. His reply was, "Why, sir, I cooked the first day's grub of vittles that was ever et in this ship!" This was true. When the ship was first commissioned, he was the ship's cook, and became, successively, seaman, boatswain's mate, and quarter master, and while holding the last named rate, he used his eyes to such good advantage that he was able to qualify as a pilot. He held this position in the *Michigan* for many years and finally, when too old for further seafaring, the influence of Admiral Jouett and some other senior officers with whom he had served, was sufficient to get him warranted as boatswain. He was soon thereafter retired with sufficient income to keep him in comfort for his remaining years.

Angus Johnston, captain of the forecastle, dwells vividly in my mind. One day when Lieutenant "Jimmie" Kelley—well known in his time throughout the service—had the duty, some work had to be done forward and he sent for Johnston to come aft to receive the necessary directions. Soon Johnston appeared at the mast. He was a Scotchman and had been a deep-sea sailor for many years. He was probably the oldest man on board and his years must have been over sixty. He was stockily built and the two most striking characteristics of his weather beaten countenance were his eyes, large and blue, and his mustache, of the walrus type that grows out very little and down very much. Kelley, having given the necessary directions, ended by asking Johnston to give his idea as to what constituted a good seaman.

His reply was, "One that can hand, reef, and steer, heave a proper lead, keep a good anchor watch in a bad roadstead, and replace a spar when it don't say how in the books." We thought that a good definition then, but it would doubtless be archaic now when the naval seaman—if there be such a thing—must very likely be a *sabe todos*, with a smattering knowledge of æronautics, destroyers, submarines, modern torpedoes, radio and many other novelties unknown fifty years ago.

Of the eighteen commissioned officers attached to the *Michigan* during my tour, only one,[3] besides myself, still survives;

> They lived their lives, they had their day,
> And time and tide have swept them away.

And we two "remainders" have in the race of life, brought buoy No. 70 perceptibly abaft the beam.

With pleasure I look back—and it seems far back—on my years in the *Michigan*; I doubt if they could be duplicated in the present age of drive, and complexity and rivalry. The old ship —I wish she had the old name—is, after eighty years of service, still "a going concern," and still stationed at Erie, where she is used for training reservists. She bids fair to out-distance Dr. Holmes's "wonderful one horse shay."

[3] Commander W. M. Irwin, Retired.

DUGAN

By Commander Charles F. Russell, U. S. Navy

DURING the World War I was detailed to command the destroyer *Waters* then being built at Cramp's Shipyard, Philadelphia. I had spent several months in command of the destroyer *Walke* based on Queenstown, Ireland, and this was my first real glimpse of the United States at war. My impressions on the streets of Philadelphia were: First, the great number of men in army and navy uniform; second, the fact that few if any of these men cared to recognize a fellow uniform wearer in the customary manner, that is, by an exchange of salutes; and, third, the fact that most people failed to differentiate between a naval uniform and the uniform of other public services, such as street car conductor, station-master, taxicab starter, etc.

Such conditions led to many amusing situations, yet there were exceptions sometimes of a startling nature. One day soon after arrival I was passed on the streets by a dignified gentleman in the uniform of a lieutenant, U. S. Navy, and right then I received a salute that no military academy could improve on, and an impression that here was an officer whose life would make an interesting story.

Soon after this I met this seventy-eight year old naval officer at Cramp's Shipyard where he was the assistant inspector of ordnance, for the Navy Department. Here began my acquaintance with Cornelius Dugan, now a Lieutenant Commander (Retired), U. S. Navy.

Being ordered as inspector of ordnance at Cramp's Shipyard a month after the Armistice was signed gave me opportunity to renew acquaintance with the active and able seaman, he being one of the assistants of that office, where he remained until he returned to retired life several months later. The friendship thus formed has been an inspiration to me and has enabled me to hear such an interesting account of the naval life of a real American that I would be extremely selfish not to share it with others.

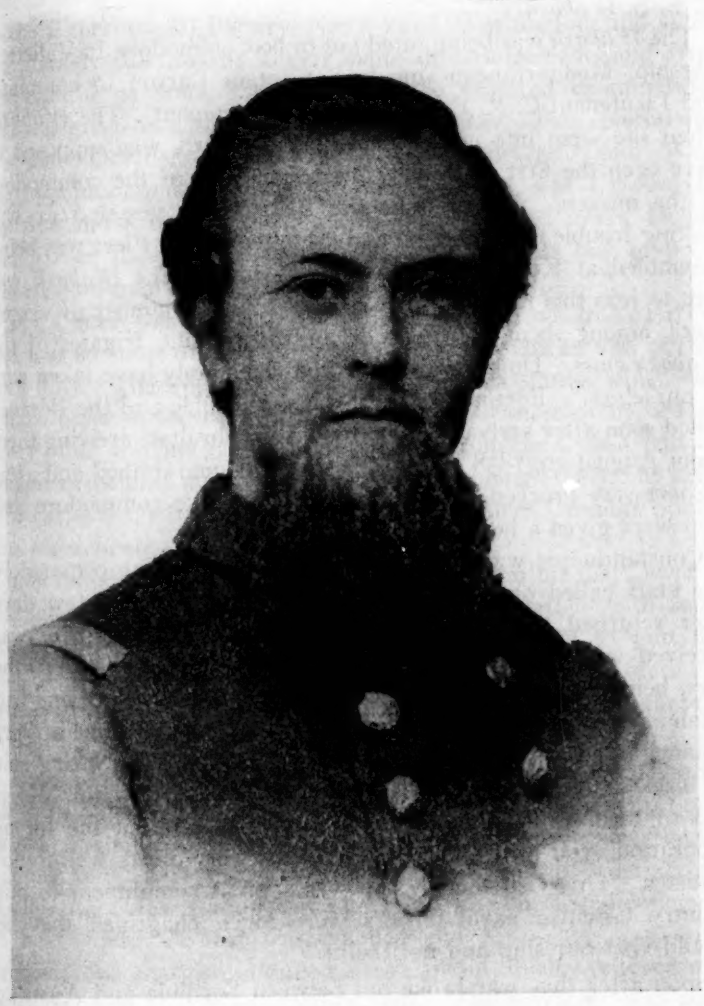
After several years I have persuaded Mr. Dugan to allow me to publish a sketch of his life.

Cornelius Dugan was born in Philadelphia, June 4, 1840, in a house at Third and Race Streets in the old city proper, as laid out by William Penn. Both of his parents, who were native born Americans, died when he was very young. His grandparents were Irish. He lived in a Quaker neighborhood, nearly all his childhood playmates being Quakers. He was christened in St. Augustine Catholic Church, Fourth and Vine Streets. This church was burned to the ground in 1844 during the riots of that date.

In February or March, 1855, he entered the U. S. Navy as a third class apprentice, enlisting to serve during his minority. He was then fourteen years of age. The pay of apprentice third class at that time was $7.50 a month. He first reported on board the Receiving Ship *Union* at Philadelphia. He says, "I was at once put to work with other apprentices, knotting rope yarns and laying up a set of clews for hanging our hammocks. We were called early in the morning. It was 'over the mastheads' to limber up. After inspection it was knotting, splicing, and rigging purchases, up and down light yards, etc. We surely were kept going. The boatswain and his mates were 'tough old salts.' We had to be up to the mark or *no leave on Sunday.* In those days it was 'implicit and unquestioning obedience.'"

About May, 1855, apprentice Dugan was transferred to the Receiving Ship *North Carolina,* an old three decker. From there he was detailed for duty on the Frigate *Congress,* fitting out to be flagship of the Mediterranean squadron. Commodore Samuel Breeze commanded the squadron and Commander Thomas T. Craven commanded the *Congress.* Of Captain Craven, Dugan has to say, "For handling a ship under sail, there was none better."

The squadron sailed in July, 1855, for Gibraltar and had a fast trip taking about twenty-five days. At this time the Crimean War was on. The squadron visited nearly all the principal ports of the Mediterranean and Adriatic Seas and the Grecian Islands; also Constantinople and many other ports, returning to the United States in December, 1857, where the *Congress* was placed out of commission in Philadelphia and the crew paid off in silver. All



GUNNER CORNELIUS DUGAN, U. S. N., AT CLOSE OF CIVIL WAR

apprentices were granted six weeks' leave. Dugan reported on the Receiving Ship *Princeton* at Philadelphia after his leave and stayed there till May, 1858, when he was transferred to the U. S. S. *Wabash.*

The *Wabash* was being fitted out to be Commodore LaVallette's flagship, Mediterranean squadron, Captain Barron to command and Lieutenant C. R. P. Rogers, First Lieutenant. The *Wabash,* when she went into commission in June, 1858, was supposed to have been the first ship to fly the square flag of the commodore at the mizzen. At this time the British war vessel *Styx* was making trouble of some kind and a United States Fleet was being assembled at Key West to put a stop to it. The *Wabash* was sent to join this fleet and upon arrival found a number of vessels there, among them the *Colorado* and *Minnesota,* frigates of the *Wabash* class. Dugan says, "We could certainly have taken care of ourselves." Fortunately there was no trouble and the *Wabash* sailed soon after arrival at Key West for Gibraltar, arriving there about August 20, 1858. Here the ship was quarantined and after a short stay proceeded to Marseilles where the commodore and ship were given a hearty reception.

Constantinople was visited in October, 1858. The commodore and staff called on the Sultan, Abdul Mezed, who a few days later returned the call. Dugan says of the Sultan, "He was received with all honors. He visited all parts of the ship, the crew being drawn up at quarters. I was on the gun deck and had a fair view of the Sultan as he passed. He walked alone a short distance in front of the others. He wore a plain, well fitting suit of black, a decoration on his breast, and a fez. Abdul Mezed was of medium height and build. On land, without the fez or decoration, you would take him for a very neat, well-to-do-minister. This visit to our ship was a great compliment to our country. British naval officers were much chagrined that he should visit our ship and not theirs."

Soon after this, war broke out between Sardinia and Austria; France came to the aid of the Sardinians. The battles of Magenta and Solferino were fought. The Kingdom of Italy was made. Dugan says, "Italy owes much to France, but I found little love among the people for France. France, we know, got Savoy, which was little to ask for the service rendered."

The *Wabash* returned to the States in December, 1859, and went out of commission. Lieutenant Rogers had singled out Dugan as a youngster of unusual ability and advised him to go to the Experimental Battery, Navy Yard, Washington, and study for gunner. Lieutenant Rogers made all arrangements and after ten months of study Dugan passed the required examinations and was given an acting appointment as gunner. This commission was dated October 30, 1860, Dugan being twenty years old. With the appointment came orders to the sloop of war *Cyane*. In the five and a half years' cruising as an enlisted minor Dugan had passed through every grade from third class boy to petty officer, landsman excepted.

The *Cyane* was commanded by Lieutenant Foxhall A. Parker and was so short of deck officers that Gunner Dugan was put on deck duty. The ship proceeded to the Panama station which was a hard place in those days. Gradually, by sickness or by orders, every other warrant officer was detached from the *Cyane*, leaving Dugan as the only member of the mess. "Among others," he says, "the carpenter, who was a newly appointed officer from the South, was *too delicate* and was soon sent home."

The outbreak of the Civil War found Dugan on the *Cyane* at Panama. Lieutenant Parker was detached together with some other officers and ordered North. Some resigned to join the South. Captain Shirley took command. The ship was ordered to cruise off St. Lucas and from there to San Francisco where a privateer was being fitted out.

Dugan says, "When we arrived in San Francisco we anchored off the wharf where the privateer lay. One morning watch, I was in charge of the deck when, about daylight, the privateer began hauling out. I reported to Captain Shirley, who ordered Mr. Arthur R. Yates, a young 'Master' who was our first lieutenant, to board her. A boat was manned and Mr. Yates, not quite dressed, took charge and pulled off. Captain Shirley relieved me. I followed in charge of another boat. The privateer was soon boarded with Mr. Yates the first on board. There was a disposition to show fight. We settled that. We anchored the would-be privateer *J. M. Chapman*, under the guns of the *Cyane*. Soon afterward she was condemned." Thus was a fair sized battle staged in San Francisco Bay in war time, not as bloody, perhaps,

as the rum runner battles of these days of peaceful murder, but, nevertheless, filled with excitement to those concerned.

After repairs at Mare Island the *Cyane* returned to Panama where Dugan was ordered North for two months of ordnance duty while standing by for orders at the front.

Orders soon came to report to Admiral Dahlgren at Charleston for duty in his old ship, the *Wabash*. At this time Captain Shirley, who had been transferred to command the *Paul Jones*, requested Dugan to apply for his ship where he could have the volunteer rank of lieutenant and would be first lieutenant. Captain C. R. P. Rogers was consulted and he advised against taking an acting appointment. So Dugan reported to Captain J. De Camp on board the *Wabash*. This vessel had had one of her launches captured a short time previous to his joining her. Dugan volunteered to try to recapture or destroy this launch. The captain disapproved but after much persuasion allowed him to make application to the admiral. This was done and Dugan received orders to report to Captain Joseph E. Green, commanding inside blockade, for special Scout Service.

Dugan says:

I selected a "White Hall" boat which was light and fast. I also selected three men, volunteers from the many who were anxious to go with me. My instructions were to give notice of the movement of vessels inside, especially those coming out. The signal was a rocket fired in the direction they were moving. I was also to blow up obstructions in the channel between Sumter and Sullivan's Island. I would be given a torpedo later. If opportunity offered, I could try it on vessels inside.

Captain Green gave me a free hand but cautioned me not to be rash. I lived where best I could, mostly, during the day in Fort Wagner. Scouting was done at night, mainly between Sumter and Moultree. Our principal excitement was keeping away from the Rebel picket boats. They would pull down under the shadow of Sullivan's Island and try to cut us off. We would then race, they soon giving up as we had the advantage, as a rule, going in only on ebb tide.

I finally received an experimental torpedo. It had originally been operated by a clock-work mechanism, and had been altered to a firing pin operated by a spiral spring, fired by a line from the boat. We had three log lines attached, one to draw out safety pin, one to fire, one to haul the torpedo back to the boat in case of failure to fire. I did not hesitate to condemn the three lines but was directed to try it. I determined to make that *try* for *something*. It might be obstructions. It might be a blockade runner, or if opportunity offered, one of those Rebel war vessels

I understood to be accustomed to drop down close to Sumter at night acting as advance guard for the Rebels.

One very dark night soon after was suited to my purpose. There was a heavy mist, and the water rather rough, a good night for the test. I managed to work in between Sumter and Sullivan's Island. Nothing could be seen but the dark outlines on the Sullivan's Island side and the black, irregular pile on Sumter on the other. The tide was flooding. When as close as I thought right I floated the torpedo to the full length of the lines attached, lay on oars and drifted along with the tide. By the feel of the lines I could tell when anything was struck. Objects could not be seen until we hit them. After considerable time our lead gave notice that the tide was turning. Feeling confident that the torpedo was somewhere near the enemy I released the safety pin and pulled the firing line. The torpedo failed to explode. We must get it back! Getting the torpedo back was a delicate piece of work. As the safety pin was out we had a fine chance of blowing ourselves up. We worked by feeling, as we could see nothing. We soon got it under the stern but while lifting it into the boat we grounded. Looking up I saw Fort Sumter almost directly overhead, looking like a black wall falling over toward us. All was quiet, my men worked as if they were at home. Not a word was spoken. There appeared no thought of danger. As I look back, I wonder at the quiet, cool indifference exhibited by my associates in this venture. We finally got back without being discovered.

The admiral later had me test this torpedo in his presence and he condemned it.

While on this duty I had trouble but once. I made signal of a movement and the rocket gave me away. I was treated to a round of grape or canister. One shot went through my boat but no one was injured. All this time my ambition was to bring back the *Wabash's* launch, but I failed to get in touch with her.

The *Wabash*, being ordered north to take part in the Fort Fisher expedition, I was recalled. I took passage on the tug *Iris*, overtook the *Wabash* and was put aboard. Captain De Camp then assured me that if I again tried to get away from him he would have me put in the brig. Next day we brought up on Frying Pan Shoals. The weather was overcast and threatening. We bumped hard. A boat was sent to the coast for aid. Meantime we threw overboard everything movable, shot, shell, small arms, spare spars, etc. Late in the day the *Aeolus*, a side wheeler, came to our assistance and after a long, hard struggle she got us off. We proceeded to the Navy Yard, Norfolk, docked, refitted and sailed with the fleet for Fort Fisher. On December 23, we joined with the fleet in the attack on the fort. We hauled off the night of December 25, having expended every round of ammunition. We refitted at Beaufort, N. C., and returned to the attack January 13. On January 15 we landed. Nearly all our sailors were armed with cutlass and pistol only. At 3:00 P. M. we advanced to the assault. At 8:00 P. M. the fort was ours. I had

charge of a division in both attacks. The ship was struck by many eight-inch Blakely shells with slight damage, as all failed to explode. The mainmast was struck twice, as a result of which we had to "fish" it.

The day after the capture of Fort Fisher the *Wabash* sailed for Hampton Roads and went from there to Boston where she was placed out of commission. From the *Wabash*, Dugan went to the *Winooski*, and within a month to the *Vanderbilt*, flagship of Commodore John Rodgers. The *Vanderbilt* was ordered to convoy the double turret monitor *Monadnock* to the Pacific. She left Philadelphia in the early winter of 1865-66, called at Norfolk, St. Thomas and ports on the east coast of South America, at Punta Arenas in the Straits of Magellan, and then Valparaiso. Here the Spanish Fleet under Admiral Nunez on the flagship *Numancia*, a broadside ironclad, was preparing to bombard Valparaiso. Dugan says, "We understood that Commodore Rodgers and the British commodore intended to prevent this, if the Chileans would dismount all their batteries and claim to be defenseless. This was done and the British commodore left. The Spaniards then bombarded the city and much property was destroyed, the city being set on fire in many places. After the Spaniards hauled off we sent working parties to give what assistance we could. I had charge of a division. We did good service.

"We followed the Spanish Fleet to Callao where they attacked again. The wooden frigates were badly torn. One hauled off on fire and finally the Spaniards were driven off. They attempted nothing more in the Pacific, but at Callao they put up a splendid fight."

The *Vanderbilt* and *Monadnock* then proceeded to Mare Island where Admiral Thatcher relieved Commodore Rodgers. Dugan says, "We had the pleasure of taking Queen Emma to Honolulu, her home. The people gave their queen and ourselves a grand reception. We had a couple of weeks of picnicing then returned to San Francisco and went out of commission."

Dugan was ordered to the *Saranac*, then to the *Pensacola* fitting out to be flagship, South Pacific squadron. From the *Pensacola* he went to duty at the Boston Navy Yard. In 1871, at Captain Shirley's suggeston he applied for duty in the *Pensacola* and was ordered to her. The present Rear Admiral

Harrington was the executive. It was on this cruise, on one of the landing parties in Panama, that Gunner Dugan contracted his only sickness. Every man and officer on this, his last expedition on shore, was taken down with fever.

Landing parties on the Isthmus of Panama for the protection of the railroad and property of our citizens were frequent. Dugan was always sent as ordnance officer and in charge of the artillery and sometimes also acted as commissary.

The present Rear Admiral Richard Wainwright was one of the lieutenants of the *Pensacola.* Mr. Dugan greatly admired this officer of whom he says, "I have often seen shot fall at his feet."

Gunner Dugan cruised on the *Congress, Wabash, Cyane, Winooski, Vanderbilt, Saranac, Pensacola, Vandalia, Supply, Tennessee,* (the "square rigger"), and the receiving ships, *St. Louis, Richmond,* and *Lancaster.*

He had shore duty at the Naval Magazines at Fort Mifflin and Iona Island and at the Navy Powder Depot at Dover, N. J. He was ordered to Dover when the timber was standing there. He superintended the erection of all the buildings there from 1893 to 1900. He planned and built the water supply, and the railroads leading to the buildings. He was offered the services of a civil engineer by Commander J. B. Coghlan who was the inspector of ordnance for the Philadelphia district at that time. He declined this offer, feeling himself to be thoroughly capable. Reports by Commanders Coghlan, Sperry, and Swift show that he made good.

An incident of the cruise of the *Cyane* serves to show the versatility and ingenuity of naval officers of that time. As Mr. Dugan tells it, "Just at break of day the look-out aloft called out, 'Breakers ahead!' We piled up on the rocks, which were not charted. We had deep water under the stern but were hard and fast aground forward and amidships. By shifting guns aft, the crew racing fore and aft and across the ship, (called sallying ship) we got off. We ran for Panama where we beached broadside to, hove down, and repaired one side, then hauled off and beached again on the other side and repaired the other side. We had about sixty-five feet of our keel and several planks torn off. All repairs were done by the ship's company. It was a nice piece of business."

Lieutenant Commander Dugan has served under many officers at sea and has been assistant on shore to Captains Nazro, Marix, Heilner, and McLean. He had been retired when Captain Nazro, an old shipmate, asked him to be his assistant. This was at Philadelphia Navy Yard. There was no boatswain there, Captain Nazro being captain-of-the-yard. Mr. Dugan went as his assistant.

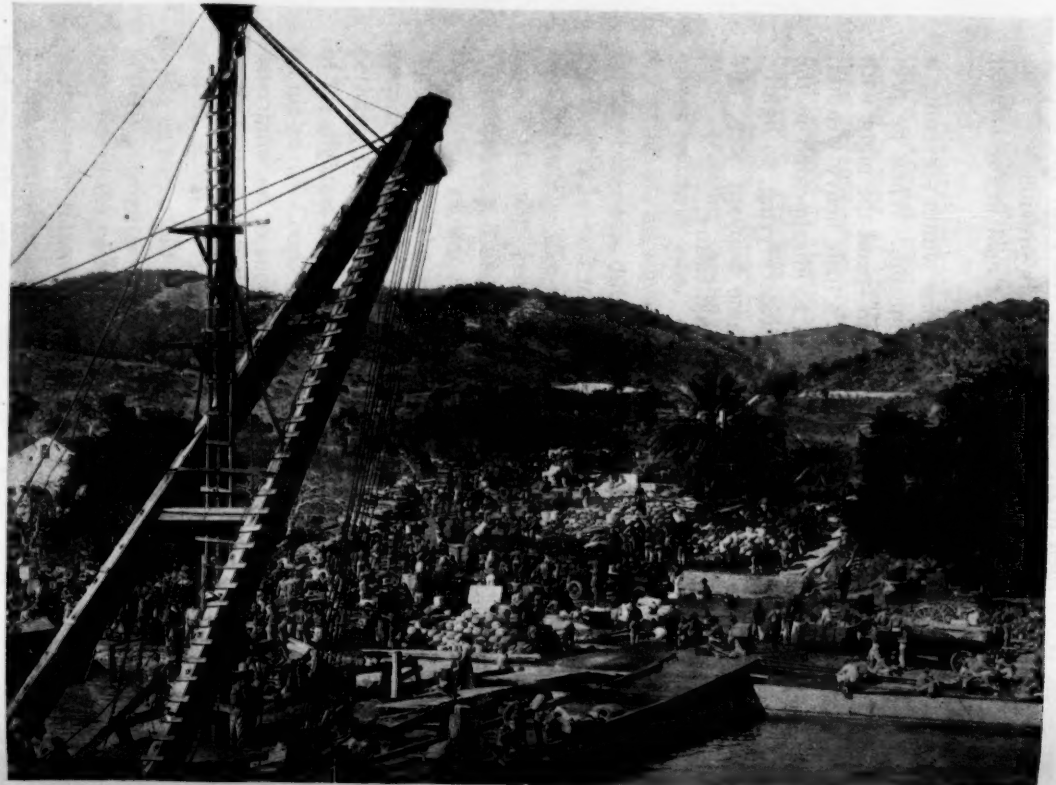
At the outbreak of the World War, Mr. Dugan, who had been retired April 3, 1901, after forty-six years of service and who had served a tour of shore duty after being retired, and who was then seventy-seven years old, volunteered for active duty and was ordered as assistant to the inspector of ordnance at Cramp's Shipyard. He was commissioned as a lieutenant by the Navy Department. Here he did splendid duty, often by his activity and versatility putting to shame the youngsters who were associated with him.

During all his naval career he was consistent in volunteering for any hazardous duty. As I was leaving Cramp's Shipyard with the *Waters* he said to me, "When you see Admiral Sims tell him that I would *so* like to be ordered over seas to serve anywhere he says. He will remember me as I have served with him." Unfortunately, I had no opportunity to deliver this message before the signing of the Armistice. Mr. Dugan has developed to the highest degree the spirit of loyalty. It is difficult sometimes to keep from adverse criticism, and one can be forgiven occasionally, perhaps, for expressing such an opinion, but never have I heard of the slightest deviation from the path of loyalty to senior officers on his part. Coupled with this trait we find in him an invincible determination to succeed. He has a spirit that is always flaming with youth and vitality. He has a respect and love for his country and its naval service that is ever his guiding light. It is such traits as these that have builded in him a wonderful character of honesty, uprightness and courage. These are the traits that we hope for in the young men of our Navy.

The year following the Armistice, Mr. Dugan returned to retired life. For many years following his first retirement he had spent the summers traveling in Europe, always accompanied by his wife until her death April 14, 1917. Since the World War he has resumed these summer trips although he says that the present day steamers cross the ocean too rapidly to suit him.

A bill sponsored by Senator George Wharton Pepper, making him a lieutenant commander (retired), U. S. Navy, passed Congress in April, 1923, and on April 16, 1923, he received this commission, being then nearly eighty-three years old and having joined the Navy a matter of sixty-eight years previously. This commission made him, he says, "the happiest man in the United States Navy."

While Mr. Dugan was dining with us one winter's evening a terrific gale with snow, rain and hail came up. When he prepared to leave we tried to persuade him to spend the night with us, but he was not worried in the least at a little heavy weather, and, watching his firm, vigorous step as he disappeared in the blizzard we could hardly realize that he was carrying, so lightly, the load of eighty years. With the same buoyant step, and dauntless spirit may he ever face the eternal future.



TEMPORARY DERRICK BUILT BY MARINE CORPS EXPEDITIONARY FORCE, SHOWING PART OF PONTOON

Temporary Device Built by Marine Corps Expeditionary Force, Showing Part of Pontoon

DISCUSSION

Selection and Graded Retirement

(See page 1999, December, 1923, PROCEEDINGS)

LIEUTENANT COMMANDER E. G. SMALL, U. S. Navy.—To describe this paper by the term timely would be trite. It describes an unhealthy condition and offers a concrete, simple, and, to my way of thinking, effective remedy.

The paper is refreshing in that the reader is spared the detailed calculations that the author made to determine that a hump in promotion is coming, with the result that in or about the year 1934 the older members of the class of 1911 and of subsequent classes will fade out of the picture without having had the opportunity of being considered by the selection board for promotion to the grade of commander.

It is of interest to note that Commander McCain in his survey of the future of personnel published some time back in the NAVAL INSTITUTE reached the same conclusion as to the time this exodus is to take place. Commander McCain had no remedy to propose. Lieutenant Doyle has offered a solution that at least should be considered.

If my memory is correct, Commander McCain said in substance that officers are willing to accept any disadvantage in their later careers that arises from graduating relatively late in life from the Naval Academy. I wish to repeat that I am quoting from memory. This is the impression I got on reading his paper, and the impression is vivid. The idea expressed seems to me rather more early Victorian than American. It savors of that one we used to find in the "Rollo" books, "My son, you should rest content in that station Providence in his wisdom has seen fit to call you." I am not sure that officers willingly accept this disadvantage. I for one may have to accept it, but certainly I do not accept it willingly.

It is unpardonable, I know, to drag personal history in by the heels in a discussion of this kind; but believing as I do that expert concrete testimony is worth any amount of glittering generalities, I am going to cite my own case. At ten years of age I first heard of the Naval Academy and determined to enter there if possible. At twelve and a half years I graduated from grammar school and chose a high school that would prepare me for the Naval Academy and that would at the same time prepare me for a scientific school in case I failed to get an appointment to the Naval Academy. Between the third and fourth years of high school, I worked a year, partly because of financial reasons and partly because my parents believed sixteen years and ten months too

early an age to enter college. Meanwhile I tried to get an appointment to the Naval Academy. There were no vacancies. I entered college as a candidate for the B.S. degree. It was not until my sophomore year that I got an appointment to the Academy and I was sworn in as a midshipman at the age of nineteen years and seven months. It is beside the point I suppose, but I have always felt that the year I spent in a machine shop and the year and a half I spent in college were not wasted. It served, anyway, to show me the world outside the Navy and to make me realize the value of the Naval Academy once I got there. Such was my history, and I know there are many officers with similar histories.

It would seem that as long as the law allows the entry of candidates into the Naval Academy between the ages of sixteen and twenty, the selection law should not jeopardize the later careers of those who enter at an age close to the upper limit. The British have a system of selection from which it is not improbable the framers of this law got the idea, but the British officer suffers no disadvantage due to late entry. All cadets enter within a few months of the same age. The requirements of being a British subject of European descent, of having parents willing to pay a fixed yearly sum for tuition and living expenses, of passing a very elementary educational test, and a physical examination, and of passing certain tests for character and aptitude, are all that are necessary. It is not necessary to obtain an appointment with its restrictions as to residence. All boys determined on a naval career can and do enter at the same age. The laws governing entry see to that—if the parents have any money. The result is that any form of selection based on age in grade in their case is just. In our service selection to be justly administered must be cognizant of the difference in ages at entrance.

Lieutenant Doyle has mentioned the officers commissioned from the warrant grades, enlisted personnel and the naval reserve. I can add nothing to what he has said. He has stated the case for them succinctly. I wish to point out that practically all those midshipmen appointed from the enlisted men fall in his category of "oldsters."

The specious argument of the *laissez-faire* school, if one can call it argument, that something is bound to happen does not hold. The fact that we had lieutenants of fifty who were admirals at sixty-two often is quoted as precedent for sitting tight, and hoping for something to turn up. It strikes me as entirely illogical to bid one to be a Mr. Micawber in a profession that above all others puts a premium on foresight.

I plead guilty to being personally interested in this proposed change in the selection law, but there are many others in the same position as I. When all is said, all that one asks is to sit in the game on an equal basis with his mates.

Why Don't They Stay In?

(See page 2048, December, 1923, PROCEEDINGS)

CAPTAIN C. E. COURTNEY, U. S. Navy.—Under "Discussion" in the last number of the NAVAL INSTITUTE appeared the following:

Captain S. V. Graham, U. S. Navy.—In this article, the author states that the mission of the recruiting service is "to secure the largest possible number of mentally, morally and physically qualified men for the Navy." His next sentence is "Modern recruiting is a sales proposition."

It would appear that we acquire what we need by buying rather than by selling. I have long been of the opinion that our recruiting service has been operated under the false impression that recruiting is a sales proposition, rather than a buying proposition, and I am convinced that the Navy would obtain much better results by employing judicious buyers instead of industrious salesmen in the recruiting service.

Captain Graham writes further in response to a request which was prompted by a desire to give the recruiting service the benefit of his ideas:

The purpose of my remarks published in the December PROCEEDINGS of the Naval Institute was to call attention to the self-evident inconsistency of obtaining what we need by salesmanship. The reading of various articles about the recruiting service, beginning with one published by Lieutenant Commander J. O. Hoffman several years ago, has led me to believe that recruiting officers have too often been so imbued with this idea of salesmanship that they have failed to keep in mind their real mission, which is to obtain *suitable* recruits for the Navy. It is true that in these articles the writers have indicated that they appreciated the real mission of the recruiting service, but the stress which they have laid on the art of salesmanship leads to the conclusion that results in numbers rather than in quality have received paramount consideration.

My observation as commanding officer afloat strengthens this conclusion. A very large number of the malcontents and bad boys appear to have been induced to enter the service through blandishments of the art of salesmanship. Expert salesmen endeavor to dispose of their wares without being too particular as to methods. Expert buyers must get just the quality which their employers demand.

The salesmanship idea also has a bad influence on the morale of the service, in that it permits of the inference that the Navy has to use exceedingly great effort to induce the proper number of men to enlist. You and I may know that this is actually the case, but it is harmful to advertise the fact unduly.

The above assertion that numbers rather than quality has been the paramount consideration in recruiting has been often repeated, but nothing is further from the truth. The standard for quantity of recruits is a fixed number, 86,000, and at all times this standard must be adhered to. The quality varies and has been as good as is consistent with getting this necessary quantity. Stressing quality has at times been overdone so that quantity was suffered to fall 3,000 below the authorized strength of 86,000 last year. Quality has a definite relation to quantity.

As to the selection now in vogue the actual statistics for the month of November will give an idea: Enlistments, 2,539; applicants, 6,554; percentage accepted, 38.74.

It would seem that this low percentage of applicants accepted would please the most exacting critic, especially when it is considered that the percentage is still further materially reduced at the training station. To be classified as an applicant a man must be an American citizen and apparently fitted for the service. This prevents the list being padded by under-age applicants, the blind, the cripples, and foreigners.

The quality of recruits is indicated by the following table:

"Bulletin No. 34" of the U. S. Bureau of Education shows the significant story of the children who enter the fifth grade of the public schools of the United States. Only sixty-three of each 100 graduate from grammar school—thirteen from high school—and two from college.

Grammar School Grade				*High School Year*				*College Year*			
5th	6th	7th	8th	1st	2nd	3rd	4th	1st	2nd	3rd	4th
100	83	71	63	34	24	18	13	7	5	3	2

Statistics for the first 3,000 recruits at the Training Station, San Diego, California, average per hundred as follows:

	Grammar School Grade				*High School Year*				*College Year*			
	5th	6th	7th	8th	1st	2nd	3rd	4th	1st	2nd	3rd	4th
1st 1,000	...	...	88.3	76.7	47.2	32.9	18.5	9.9	2.3	...	...	...
2nd 1,000	...	...	90.3	76.9	45.7	30.8	17.5	9.1	2.0	..	...	...
3rd 1,000	...	...	90.9	78.6	44.6	31.3	18.5	10.2	2.9	...	...	...

It is inferred, therefore, that the quality of navy recruits is above the average.

Now as respects the number of bad boys and malcontents induced to enter the service, there will naturally be some disagreement with the opinion expressed. An experienced officer recently stated that one per cent would probably cover the number. As respects the number of bad boys and malcontents naval officers should naturally be solicitous to see that the number entering is not increased through bad associations after entering the Navy. This parental duty the naval officer falls heir to, as many of the boys are young and have been recently removed from parental influence.

The work of the able officers and men on recruiting duty during the last eighteen months speaks for itself. Six hundred officers and men have secured 45,000 first enlistments. In peace times recruiting stations are merely employment agencies. The element of patriotism cannot be depended upon in times of peace to keep the ranks filled. In face of the competition which exists in civil life, a deficiency of 3,000 in the authorized strength was made up in the last six months. There is very little unemployment throughout the land and wages are unprecedently high, mechanics in some places getting as much as thirteen dollars a day. The success achieved under these conditions is really remarkable.

Only those officers whose records show that they are fitted for this duty are now placed on recruiting duty. They have the additional duty

of acting as the navy representatives in civilian communities. A tour of recruiting duty is undoubtedly a broadening experience for naval officers as they gain a new point of view, resulting in a changed attitude toward the enlisted personnel. Realizing how difficult it is to get men into the Navy, they show much greater patience and desire to help the young recruits in the service. They realize the great harm that is done the quality of the Navy by the vast number of men who leave the service before the expiration of their enlistments. These men indulge in a great deal of anti-navy propaganda and in some communities they are very numerous and are able to counteract the work of the recruiting force. Necessarily from such communities we cannot expect to draw a good quality of recruits.

The large proportion of desertions from the large ships would indicate that the recruit does not respond readily to mass training, but there has been experience to show that when he is put on his mettle and treated as an individual and given a chance to demonstrate his superiority, he appears to advantage. The promotion of interest and desire to remain in the service is well served by compulsory daily professional training of all individuals, with examinations periodically and competition in marks in professional subjects, the same as at the Naval Academy. This would not only serve the individual but also the Navy as it would soon fill up the vast number of vacancies in our petty officerships. Such a system is not in force now but has been tried on individual ships with success. The ship efficiency of vessels whose crews are training along these lines in addition to their regular ship drills leaves little to be desired.

Salesmanship is now solidly lodged in the recruiting service to the great advantage of the officers and men who have had the opportunity to study and practice it. The disfavor and antagonism in which it is held by some naval officers is probably due to a lack of understanding of it. The course of study employed by the recruiting service is the Alexander Hamilton Institute Course in Salesmanship and Sales Management. Individual prospects are sought out, a contact is made, attention is created, ripened into interest, and interest developed into desire to enter the naval service.

As to the jargon of salesmanship I quote below a talk, one of those given weekly by a recruiting officer to his men:

To keep the old "fighting spirit" and maintain a proper frame of mind toward your work, you must first believe in what you are selling—then display force, logic, sincerity, earnestness and enthusiasm in every word and gesture. The greatest attribute is enthusiasm.

Armed with that attitude, you can withstand every style and form of resistance and come through with your full share of the enlistments—without it you become an easy mark for the most trivial and commonplace excuses of the prospective applicant.

Victory at any time and under any circumstances is largely a matter of guts and determination—if you really believe in what you are doing, it is a token of true manhood to stand your ground—if you lack faith in your own purpose, then the most favorable conditions will not make

a winner of you. Everywhere and in everything, there is a "For and Against" which produces perpetual contest.

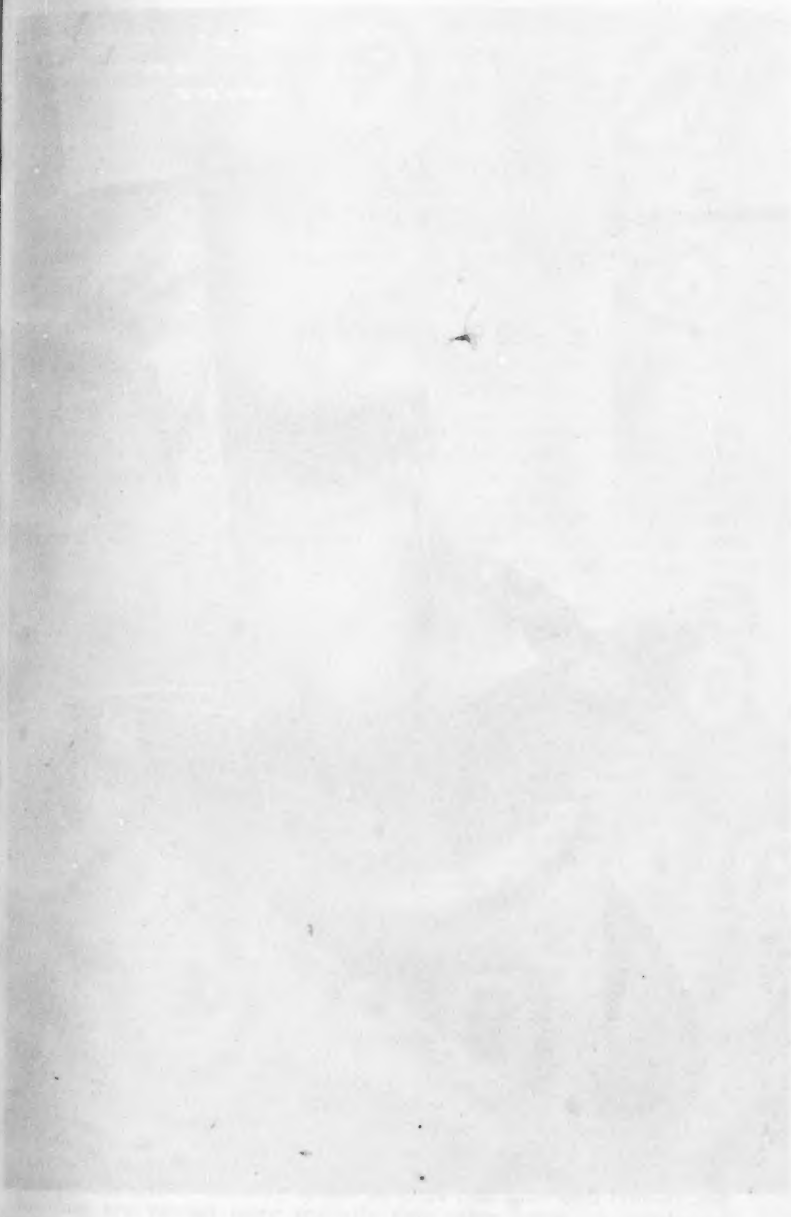
In recruiting, as in selling anything, this contest is developed to a highly scientific point, and only those who work along the most scientific lines are able to carry the banner of victory and success. The unscientific recruiter will find that the only men he can sell the Navy to are those who are already pretty well convinced or men who are driven to enlist by force of circumstances. When the easy pickings are scarce, the unscientific recruiter will find his score slipping because his tactics won't work with the class of prospects he then has to tackle.

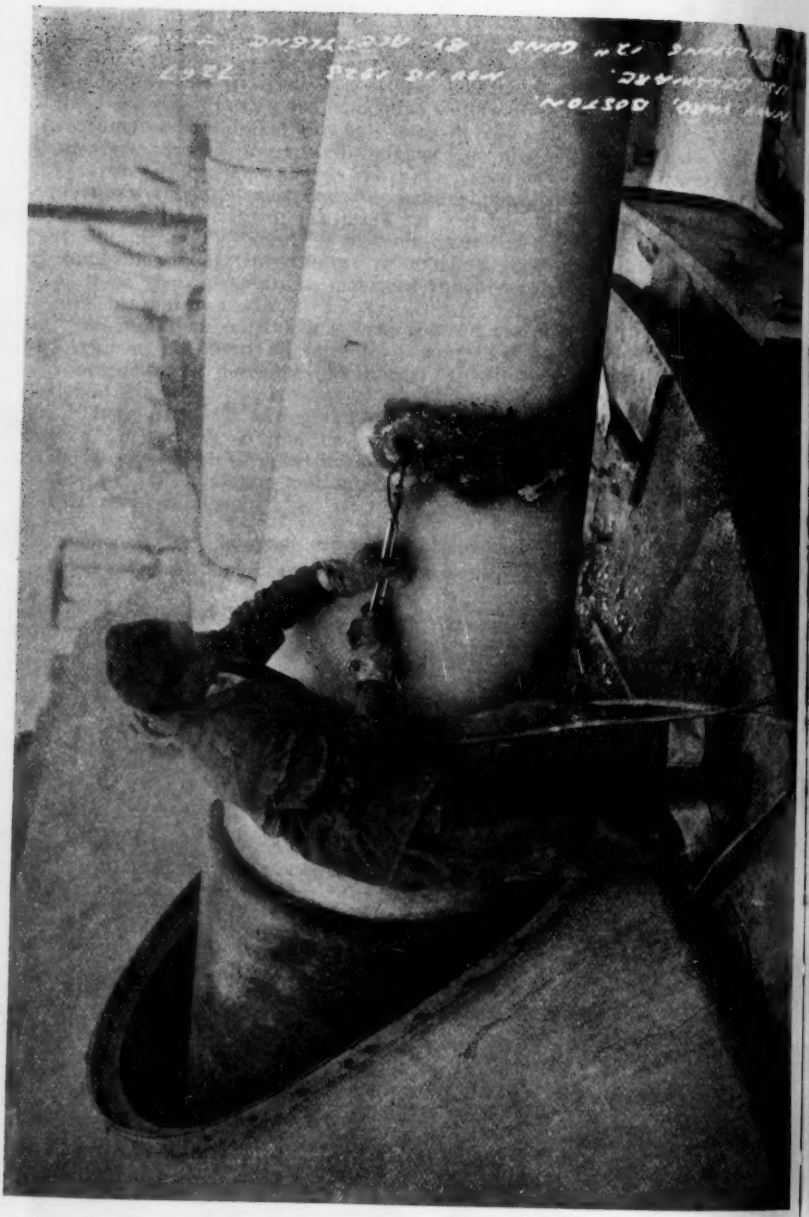
The prospect's defense is in most cases based upon personal characteristics, individual temperament or existing conditions—and one or more of these elements must be mastered and overcome by the recruiter every time he makes a sale.

Whenever an enlistment is lost, you can rest assured that the prospect's "Against" has been stronger than your "For" and the more you allow yourself to be defeated, the harder it will be to keep on staving off defeat.

There is an old saying that "Nothing succeeds like success" and it is true for the reason that to win a hard fought battle gives you a big moral advantage to fight the next one with. It's like a race boat's crew that gets a good start and stays ahead all the way because the men feel that they are winning.

This is the language of salesmanship and also that of leadership. Good salesmanship means good leadership.





PROFESSIONAL NOTES

PREPARED BY

LIEUTENANT COMMANDER H. B. HIRD, U. S. NAVY

AND

LIEUTENANT J. B. HEFFERNAN, U. S. NAVY

GENERAL ARRANGEMENT

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GREAT BRITAIN

THE NAVAL PROGRAM.—*Naval and Military Record*, 23 January, 1924.—Questions of defense occupied only a few lines in the King's speech, but the two items relating thereto are of far-reaching significance. Parliament was notified that it would "be asked to assist in providing work in the shipbuilding industry by the immediate construction of cruisers and auxiliary craft in anticipation of the naval program." It was also informed that proposals would be submitted for "the expansion of the Royal Air Force in connection with home defense." From the phrasing of the first item the building program will evidently not be limited to cruisers. "Auxiliary craft" is a term which has acquired an elastic meaning since the Washington Conference, when it was applied indiscriminately to all men-of-war displacing 10,000 tons and less, such as cruisers, destroyers, submarines, gunboats, etc. Aircraft carriers were treated as a class apart.

What the new program actually contemplates remains to be seen. There is an impression that sanction will be asked for the laying-down before the close of the financial year, March 31, of six 10,000-ton cruisers and a batch of large submarines for ocean-going service. At least two of the cruisers and all the submarines are likely to be built in the royal yards. While the shortage of up-to-date destroyers, comparable in size, armament, and endurance with the numerous large boats now building abroad, has not been overlooked, the Admiralty appear to think that additional cruisers and submarines are needed more urgently than other types. A substantial program of destroyer construction must, nevertheless, be put in hand in the early future if the navy's anti-submarine organization is to remain adequate and efficient. In spite of the wonderful progress made with the

development of scientific devices for countering the underwater menace the destroyer is still the submarine's deadliest enemy.

In recommending the immediate construction of cruisers and auxiliary craft for the purpose of providing the shipyards with much-needed work, the speech omitted to add that the vessels were, in any case, required for national defense, a point which it would have been better to emphasize. If the only object were to alleviate unemployment, critics might urge that the money could be expended more profitably on public works. To those in touch with naval affairs, however, the urgent need of more cruisers and submarines has long been apparent. The change of Government may cause some delay in launching the program, but we do not share the view that the whole scheme may be repudiated by the new Cabinet. When Mr. Baldwin advocated the provision of new ships he was acting on the advice of the Admiralty, who are responsible, under the Government, for naval defense.

The incoming First Lord, whoever he may be, will find his naval colleagues by no means disposed to acquiesce in the cancelling of a scheme which they regard as essential to naval efficiency. From this point of view it is all one whether the present Sea Lords remain at their posts or are relieved by other officers; their successors would undoubtedly tender the same advice as regards new construction. If that advice were to be rejected, the onus would fall on the government, and, putting the matter on its lowest level, it would be bad tactics for the Labor party to signalize their advent into power by cutting down the nation's defenses. Times have changed since one of its prominent members declared that "the Labor party is the little-navy party and is proud of its name."

An interesting correspondence has been proceeding in *The Times* on the subject of future warfare, with special reference to air operations. It began with a letter from Brigadier General P. R. C. Groves, who contended that the development of aviation has introduced a new factor into strategy by enabling one belligerent to strike directly at the civil population of another, a method which might bring about a decision irrespective of the course of operations on the military and naval fronts. This proposition has been challenged by other authorities, notably Admiral Sir Cyprian Bridge, who insists that the sole objective in war should be the enemy's armed forces, whether on land, at sea, or in the air. In his judgment the only effective way to counter overhead attack is by seeking out and destroying the enemy's aircraft. The bombing of centers of industry and population he considers to be futile and fruitless.

General Groves, on the other hand, espouses the doctrine laid down by Marshal Foch—that the bombing of enemy cities may prove decisive because its crushing moral effect "may impress public opinion to the point of disarming the government." As generally happens in such controversies, each of the protagonists seems to take an extremist view of his case. Admiral Bridge would apparently negative all attacks on enemy centers outside the immediate zone of war and confine his offensive to hostile air flotillas and aerodromes, while General Groves, judging from his letters, would prefer the intensive bombing of enemy cities and factories, in the hope that the civil disturbances resulting therefrom would compel the government concerned to sue for peace.

Experience is usually a safer guide than theory, and its teachings are at our disposal in this particular dispute. Broadly speaking, German air strategy in the late war followed the lines indicated by General Groves, while the British operations—until the concluding year—were based on the principles laid down by Admiral Bridge. In both cases the result was indecisive up to a certain point. But in the spring of 1918 our bombing squadrons began to favor German centers of population and industry with

their attention, whereupon the German air attacks on this country abruptly ceased. That the increasing efficacy of our anti-aircraft defense at home had something to do with this sudden cessation of the Gotha raids is, no doubt, true; on the other hand, it has been admitted in Germany that the development of our air offensive against towns and factories in the Rhineland led to a big concentration of German machines in that area, leaving few available for attacking England.

For the three previous years we had been devoting our attention exclusively to enemy aerodromes, yet all our efforts in that direction failed to prevent the systematic bombing of London and other centers in this country. Evidently, therefore, Admiral Bridge goes too far when he declares all air raids outside the actual war zone to be "futile and fruitless." At the same time, General Groves' suggestion that a belligerent power may be forced into submission by air attacks on its home territory is not borne out by war experience. No such effect was produced either in France or England, though both suffered rather severely from German air raids. In fact, these visitations served mainly to strengthen the people's resolution to continue the struggle at all costs.

DISTANCE AND STRATEGY.—*Naval and Military Record*, 16 January, 1924. —Since we adverted to the subject a fortnight ago, more has been heard of the proposal to develop a great naval base either at Simonstown or Cape Town itself. One provincial journal states that "the plan commends itself to the Admiralty as a cheap and satisfactory substitute for the more expensive base at Singapore, and as one, moreover, that would be more likely to obtain parliamentary sanction." We venture to doubt whether this represents admiralty opinion. A great naval station at the Cape would be desirable enough, but as a substitute for Singapore it would be practically useless, as a reference to the map will immediately show. The unique advantages possessed by Singapore as the headquarters of a fleet charged with the defense of our Pacific interests were explained by the First Sea Lord to the gathering of M.P.'s whom he addressed during the previous parliamentary session. Distance is, of course, the governing factor in this question. Ships stationed at Singapore would not only be within three days' steaming of Hong Kong, but would occupy an ideal position for cutting across the flank of any hostile force that was coming south to attack Australia or New Zealand. Our modern battle cruisers could make the run from Singapore to the north coast of Australia in a week, and could even be at Sydney in nine days or less. But a fleet stationed at the Cape would be far more remote from the danger zone. From Cape Town to Sydney is a run of 6,150 miles, and to Auckland 7,300 miles, and at neither of these ports is there a dock capable of accommodating our latest battleships or battle cruisers.

Only in the event of the Mediterranean being closed to us would the Cape station assume high importance. In that contingency it would necessarily become the halfway house between England and India, which is a reason quite sufficient to justify the extension of naval facilities at the South African base. We repeat, however, that there can be no question of enlarging the dockyard at Simonstown as a practical alternative to Singapore. If the latter scheme is abandoned, it will mean that the British Navy cannot in future guarantee the safety of two of the principal Dominions of the Empire, and that Hong Kong and the whole of our valuable far eastern trade will be lost to us if we ever come to blows with a great Asiatic Power.

In other words, the safety of Australia, New Zealand, Hong Kong, and our other possessions and interests in the Pacific will henceforth depend on the goodwill of an alien people. Nor would these dire consequences

be averted by building a new dockyard at the Cape. It rests with the next Government to decide whether, for the sake of a few million pounds, we are to turn our back on Imperial responsibilities of the first magnitude and incidentally break the pledge that was given to the Dominions through their representatives at the recent Conference. The decision to complete the works at Singapore was ratified by Mr. Baldwin's Cabinet, not in the name of the Conservative party, but in the name of Great Britain. To go back upon it now would be to commit a breach of faith which our kinsmen overseas would inevitably regard as an affront to themselves.

Some arresting facts with regard to the present and future composition of the British battle fleet, as regulated by the Washington Treaty, appear in an article in *The Navy*, the organ of the Navy League. For the next two years we have a right to twenty-two capital ships, but after 1925 this number must be reduced by two, the completion of the *Nelson* and the *Rodney* sending four older ships—*King George V*, *Ajax*, *Centurion*, and *Thunderer*—to the scrapheap. In 1931 we shall be at liberty to lay down two further battleships, which, when completed in 1934, will displace the four *Iron Dukes*, thus reducing the battle fleet to eighteen units. This will remain the establishment until 1936, when the passing into service of three new battleships must coincide with the deletion of the five *Queen Elizabeths*. In that year, therefore, the fleet will consist of only fifteen ships, nor must this number be exceeded as long as the treaty remains operative.

As the writer of *The Navy* article observes: "A fleet of capital ships numbering only fifteen seems absurdedly small for the whole British Empire, considering its utter dependence upon sea power; but that is, nevertheless, the maximum establishment we shall be authorized to maintain after 1935. It must be remembered, of course, that the United States will be similarly rationed in respect of capital ships, while Japan, as the next strongest naval Power, will, in 1935 and later years, have only nine of these ships all told."

Under the limitation scheme there can be no second-line battleships, and consequently no reserve of such ships. This is likely to produce a marked effect on future naval strategy, for the heavy ships will be much too precious to be risked on amphibious "side-shows" such as were undertaken so freely in the late war. A further result of the restriction of battle fleets will be to enhance very considerably the relative power of small craft, specially cruisers.

Large Carriers or Small?—*Naval and Military Record*, 9 January, 1924.—Japan and the United States have chosen to invest most of the tonnage aggregates allotted to them in a few carriers of very large dimensions, up to 33,000 tons in some cases. The wisdom of this policy is open to question, for the aircraft carrier is at least as vulnerable as the battleship to underwater attack, and far more so to assault by gunfire or bombs. A fleet that possessed two or three gigantic carriers would be in greater danger of having "its eyes put out" than one which had a dozen 10,000-ton carriers, and there is general agreement that future naval actions will be decided largely by air operations. An admiral whose aircraft tenders had been sunk or disabled would fight under a terrible handicap. Through lack of aerial spotting his guns would be ineffective at extreme range; the movements of such enemy ships as were beyond his field of vision would be unknown to him, and his own fleet would be exposed to attack by aerial torpedoes and bombs, a menace that might prove deadly in the absence of protecting aircraft. These truths are so obvious that each side will do its utmost to dispose of the hostile carriers at the very outset of the action, and, other things being equal, the fleet which has its aircraft distributed

among the greatest number of ships may count on keeping the upper hand in the air. We are well aware of the advantages of great displacement, such as higher speed, increased stowage capacity, and larger flight decks, but are none the less convinced that the soundest policy for this country is to build its future aircraft carriers to the smallest dimensions compatible with efficiency.

BRITAIN'S NEW GIANT SUBMARINE SHOWS DEFECTS.—*Boston Transcript*, 28 January, 1924.—London, January 28.—One of Great Britain's experimental giant submarines, the *X-1*, failed to come up to expectations in two tests, according to the *Westminster Gazette*. The first trial revealed defects that necessitated a suspension of the tests, but subsequent alterations resulted in no improvement. The newspaper describes the boat as "a tremendous advance on all other underwater craft in size, displacement and speed."

THE "COLORADO'S" VISIT.—*Army, Navy and Air Force Gazette*, 12 January, 1924.—Nothing could more forcibly illustrate the weakness of our Navy in ships of the latest class than the visit of the *Colorado* to Portsmouth this week. Such an event inevitably suggests comparisons, and in the past it has been ship for ship, gun for gun, with a superiority on the whole, it must be admitted, in favor of the product of the British constructor. On this occasion, however, we have absolutely no ship to compare with the American vessel, and yet the latter has two sister ships, the *Maryland* and the *West Virginia*, in commission. Our solitary post-Jutland ship, the *Hood*, is a battle cruiser, with a fifteen-inch gun armament, of a type that is certainly never going to be repeated. But as against the American trio, and the Japanese *Mutsu* and *Nagato*, we have nothing, nor will have until the *Nelson* and *Rodney* are completed, which, thanks to the boilermakers, is not likely to be for another two years.

SEA POWER TODAY.—THE NAVY LEAGUE'S POSITION.—*Army, Navy and Air Force Gazette*, 12 January, 1924.—A satisfactory feature of the present naval situation in this country is the revival of interest in the work and aims of the Navy League. Under the judicious guidance of Sir Cyril Cobb, M.P., chairman, and Mr. Gerard Fiennes, the well-known naval writer, vice-chairman, the new Executive Committee certainly seems to have infused new life into the League, and recalled it to the path mapped out by its founders thirty years ago, from which it temporarily strayed after the Armistice. An excellent considered opinion on the existing naval situation has been sent out to all the League's branches at the beginning of the New Year. It cannot, of course, be expected that the League should all at once obtain the strong support which it obtained from the Mother Country and the Empire when the growth of the German Navy was threatening the very existence of the nation; but it may be recorded with satisfaction that in the year now past there has been a re-birth of interest in the navy and a growing realization of the fact that, if imperial unity is to be preserved, the fighting fleet must be maintained at a standard of strength sufficient to secure our sea communications against any possible attack. This, of course, has helped the League.

The Executive Committee have maintained throughout the year a steady policy of re-organization; educational work, both among adults and in the schools, has been steadily expanded, and the efficiency of sea-cadet corps and training ships has been well maintained. All possible support has been given to the policy which the responsible heads of the navy have declared essential to the maintenance of a proper standard of sea power within the limits of the Washington Treaties.

With the conclusion of a definite peace in the Near East, the ships of the Atlantic fleet have returned to their proper stations, and the main force of the navy is once more concentrated according to post-war plans. It is satisfactory that it has been found possible to organize a squadron consisting of our two most powerful battle cruisers, *Hood* and *Repulse*, together with four light cruisers, to undertake a prolonged tour round the Empire. The squadron has already called at Sierra Leone and has spent its Christmas at the Cape. During the ten months of its absence from home waters, it will visit all the principal states of the Empire, and will also bear the greetings of Britain to our friends in the United States. Some of the vessels will also visit South American ports. The voyage of these ships will be a valuable proof to our kinsmen oversea that British sea power is still a real and living thing, and that the Mother Country is prepared at all costs to maintain the unity of the Empire.

The Empire cruise, naturally, suggests the need of fuelling and repairing bases in the distant parts of the world where fleets may be required to operate, and this, as naturally, leads to consideration of the proposed naval base at Singapore. The expenditure of many millions of money on the provision of docks and repairing shops has, not unnaturally, been hotly challenged at a time when parsimonious spending is of the first importance. But the Admiralty has been able to present an indisputable case for this development, and that it is a matter of urgent necessity may be gathered from the fact that the Government of the Straits Settlements has purchased and presented the necessary land, and that the Governments of the Australasian Dominions have contributed their quota to the cost of equipping the base. Singapore is so situated that the establishment of a naval base there is demonstrably a defensive and not an aggressive measure. The project is, therefore, in line not only with the letter, but also with the spirit of the Washington Treaties.

As regards new construction, the battleships *Nelson* and *Rodney* have made but slow progress, partly owing to the dispute which kept the boilermakers out of work for many months.

Details of other vessels are withheld from the public, but it may be said that constant experiment is going forward to meet the peculiar menaces revealed by the events of the war. The Prime Minister has announced that a number of light cruisers are to be built to replace the cruisers of the *County* class, and some of them will be put in hand at once, in order to lessen the burden of unemployment. The Executive Committee think it right to draw the attention of the League to the fact that, whereas the construction of capital ships and other vessels over 10,000 tons is limited by the Washington Treaties, the competition of the naval Powers in the construction of light cruisers threatens to become more pronounced. "In the country of the blind, the one-eyed is king," and if the battleship, as this generation has known her, is ruled out by international convention, the light cruiser will become the "capital ship," and the issue at sea will be decided by preponderance in this class.

It is satisfactory to know that the League has not overlooked the welfare of the personnel. The suggestions of the Anderson Committee, it is stated, for reductions of naval pay have met with little public support. The business man reasoning that, because naval life appeals to the adventurous spirit of a number of young Britons, therefore the emoluments offered may be safely reduced below the standard which obtains on shore has been decisively rejected. It is recognized that life in the Navy has its special features, and that if we are to keep a happy and self-respecting personnel the pay must be sufficient to maintain not only the sailor himself afloat, but also his wife and family in a position worthy of the sailor ashore. After all, the men we send to the uttermost parts of the earth represent

Britain. They must be men who respect themselves and are worthy to be a type of the race. We shall not obtain such men if we are driven to rely on "recruits of hunger." The pre-war pay of the bluejacket was scandalously low, and the present scale only gives him what is his due, quite apart from any consideration of the scale of living. The Navy League will oppose any reduction in naval pay by all the means in its power.

No mention has been made of the aircraft required for work with the fleet, pending further information as to the suitability or otherwise of the proposals made by the Government for co-operation between the Board of Admiralty and the Air Ministry. A word is said in conclusion about the condition of the Merchant Navy. The experience of the war impressed upon the mind of the nation the fact which was well realized in Napoleonic days, that the Royal Navy and the Merchant Navy are all one. Command of the sea is futile unless conditions, economic as well as military, permit the merchantman his lawful occasions. Unfortunately, the shipping trade during the past year has suffered from continued depression. Over a million tons of shipping have been laid up in our ports. It is not within the province of the Navy League to propose a cure for this evil, but the Executive Committee calls upon all members to resist any policy which is likely still further to depress merchant shipping, and to support any policy which may increase its chances of activity.

The near prospect of the accession of the Labor party to office, the League manifesto concludes, makes it the more urgent that the League should receive wide-spread support in its endeavors to make the nation realize its dependence on seapower. There is no reason to think that the Labor party is less desirous of supporting the safety, honor and welfare of our Sovereign and his dominions than any other. But they are unfamiliar with the implications of sea-power, and, therefore, patient, good-humored and convincing work is the more demanded of members of the Navy League.

THE NEW NAVAL CHIEFS.—*Army, Navy and Air Force Gazette*, 2 February, 1924.—Greatest of the surprises in the composition of the new ministry is the selection of the civil members of the Board of Admiralty. Mr. MacDonald's choice has been welcomed by all parties, with a measure of satisfaction which we are glad to share, since it indicates a determination not to expose the Navy to experiments of a socialistic tendency. In a way it is a complete answer to the suggestions of pessimists that the advent of a Labor Cabinet would mean the ruination of the protective forces of the Empire. The new First Lord took occasion to deny promptly the statement made by the political correspondent of the *Westminster Gazette* that the project for the great Singapore dock was to be dropped, and the works stopped in the interests of national economy. The Government has not even discussed the question yet, and common sense ought to have told anybody that such precipitate action, before consultation with the naval chiefs, is not only extremely unlikely, but is also entirely out of accord with everything which the Prime Minister has done since he took office.

In Viscount Chelmsford the Navy has a First Lord in whom it can feel complete confidence. His record as Governor of Queensland and New South Wales, and as Viceroy of India during the critical years from 1916-21, showed him to be an administrator of sound judgment and high capacity. Rear Admiral Bertram S. Thesiger, C.B., C.M.G., recently studying at the War College, is his cousin. Mr. C. G. Ammon, the new parliamentary secretary, has a good record of public municipal service, and there is no reason why he should not make as great a success at the

admiralty as Dr. Macnamara did during his twelve years in this post. Mr. Frank Hodges is a trade union leader of an enlightened and up-to-date type, who has had the benefit of university training at Ruskin College, Oxford. The Navy is fortunate in having obtained the services of three men of such varied attainments and experience, and if they pull together, as it is to be hoped they will, and are guided by the knowledge of their professional advisers, there should be no doubt about the future efficiency of that service upon which the safety, honor and welfare of the State chiefly depends.

BRITISH NOT PLEASED BY FRENCH AIR FORCES.—NEW SUBMARINES, TOO, LEND A SINISTER MEANING TO THE HOSTILITY WHICH THE FRENCH PRESS MANIFESTS TOWARD ENGLAND.—By Hector C. Bywater, *Baltimore Sun*, 8 February, 1924.—London, January 17.—Much was heard during war days of the obliquity of the German mind. When we found benevolent German savants, philosophers and even clergymen condoning or actually applauding such deeds as the rape of Belgium, the massacre of Louvain and the drowning of women and children at sea, and doing so with a sincerity not to be mistaken, we put the phenomenon down to "Teuton mentality."

Whether it was due to some fundamental dissimilarity in mental make-up or was merely the result of war-psychosis reacting differently on two nations of common stock, it is certainly the fact that so long as the war lasted the Briton and the Teuton could never see eye to eye on any question relating to the struggle. Patent truth to one was blatant falsehood to the other.

This was the more singular because in ordinary times the Englishman found the German outlook on things in general to be much the same as his own. Intellectually, he felt less of a stranger in Germany than in any other land save the United States, and those who have lately been in Germany agree that the mental barrier which divided the two peoples in war time is fast breaking down.

Today, the nation whose views and sentiments are least intelligible to us is not Germany, but France. French policy since the war, but particularly in the last two years, has been utterly inconsistent with its professed aims.

We were led to believe that France yearned for security, for reparations and for peace, yet she has done almost everything possible to make these objects unattainable. She has inflamed the German passion for revenge by going out of her way to make defeat intolerably bitter, humiliating and painful to the vanquished. By attempting to throw the whole economic system of Germany permanently out of gear she has made the payment of reparations on the required scale physically impossible. And by subsidizing militarism in all the new-fledged states of Europe she has already placed peace in jeopardy.

No friend of France can honestly deny these statements; the evidence is too plain. Whatever else her acts may portend, they point irresistibly to one conclusion: She has no further use for the friendship of Great Britain and no scruples about trampling British interests underfoot when they get in the way of her own. French hostility is becoming too obvious to be ignored. It is beginning to alarm even those who have hitherto been foremost in defending the worst aspects of French policy. "Hats off to Poincaré!" is a cry which has distinctly fallen flat of late.

This is what a distinguished British soldier, General Sir Ian Hamilton, writes in a book addressed to service and ex-service men:

"A minor statesman has declared that Englishmen who criticise M. Poincaré are criminal. Is that really the last word in English statesman-

ship? The French may seem to be turning out the pockets of the Germans; no one realizes better than they do that it is our pockets they are searching. We look on at the process spellbound by words, hypnotized by a set of old war clichés. Unless we wake up quickly to living facts, as, for instance, that—thanks mainly to our little army of the Rhine—we have more friends in Germany alone than in all France, Italy and Belgium lumped together; unless we realize these facts and act upon them quickly we are done!"

In face of the accumulating proofs of French ill will, few have the heart to keep up the pretense that such a thing as an *entente cordiale* still exists. It is not merely that the French newspapers, without exception, habitually use language about this country scarcely less venomous than that which they applied to *les Boches* at the height of the war; though, as some one has remarked, it is just as well that few Englishmen are able to read what the Paris journals say about them. Actions speak louder than words, but in this case words and deeds are absolutely in accord.

While the average citizen may not be keenly interested in what is going on today in the Ruhr or the Bavarian Palatinate, he has begun to take notice of French policy in regard to aircraft and submarines, the significance of which he fully understands. He asks himself whether there is any connection between M. Poincaré's cavalier treatment of this country and the fact that France has now 128 squadrons of bombing airplanes ready for instant action, all but a few of which are stationed at aerodromes within easy reach of the Channel.

The question answers itself, or at any rate is answered by those French writers who assure us day by day that the once puissant *Grande Bretagne* now finds it expedient, in view of French aerial supremacy, to walk warily lest she tread on the tail of her Gallic neighbor's coat. Already the British Government's decision to strengthen the air force for home defense has evoked demands in the Paris press for a corresponding addition to the French air squadrons, an addition which is, in fact, in process of being made.

Nor is it only in the air that France is furnishing herself with the means of coercing this country—"bringing moral pressure to bear" is the euphemism favored by Parisian journalists. Since Captain Castex proudly proclaimed the German *U*-boat warfare to be a French invention —foreshadowed and strongly advocated by Admiral Aube more than thirty years ago—the French Government has embarked on a large program of submarine construction.

Fifteen boats were begun during 1922, and by a decision reached last week thirty-nine more, all of big dimensions, are to be built within the next few years. These boats, together with those already in commission, will bring the French submarine flotilla up to ninety units—sixty more than Germany possessed on the outbreak of war.

Now this great fleet of underwater craft may be intended, as France says it is, solely for the defense of her sea communications with Algeria, Tunis and Senegal, whence she looks to obtain a million and a half colored troops in time of emergency. But the boats could just as well be employed as commerce raiders; and seeing how every French naval writer recommends the *guerre de course* as the only method of defeating an enemy of superior strength at sea, there is good reason to anticipate that they would be so employed.

Geographically, France is in an infinitely better position for waging *U*-boat warfare against British shipping than Germany ever was. Her coast line fronting the Channel, the Atlantic and the Mediterranean contains any number of harbors from which submarines could operate, and

by no possibility could the British Navy keep all these ports under observation, let alone blockade them. Assuming the French submarine service to be as efficient in personnel and material as the German service was, ninety boats should be capable of inflicting such losses on British shipping as would bring this country to the verge of starvation.

If France were deliberately seeking to arouse the suspicion and enmity, not merely of the British Government, but of the British people as a whole, she could not do it more effectually than by the methods she is now pursuing. On the one hand, she maintains an immense number of airplanes, which, as her own newspapers do not hesitate to remind us, could devastate London and the southeastern counties of England in the space of a few hours, and to which the meager British air force could offer no serious resistance. On the other hand, she is constructing a powerful fleet of submarines, ostensibly for the one purpose they are least adapted to serve—that is, to keep open the routes between France and her colonies—but actually, as we are justified in assuming, to threaten Great Britain with a repetition of the menace that so nearly destroyed her in the late war.

The plain Englishman is loath to believe that his late Allies and comrades-in-arms should be already plotting his ruin, but how else is he to interpret their bellicose words and acts? He knows that his own country has forfeited most of the prestige and influence it formerly enjoyed in the councils of Europe, and he sees it flouted or coldly ignored by French statesmen when matters of vital interest to Britain are at stake.

At no time in the pre-war period was German policy more strongly anti-British than French policy is at the present day. What rendered the intrigues of the Berlin Foreign Office so dangerous to peace was their coincidence with a rapid expansion of German naval power. Now that we are confronted with much the same situation in France, where an aggressive policy toward ourselves goes hand in hand with an almost feverish development of the weapons to which we are most vulnerable, it is no wonder that some thoughtful people here are asking whether M. Poincaré, like Louis XVI and Napoleon, believes the overthrow of British power to be an essential preliminary to the fulfillment of his country's destiny as arbiter of Europe.

Others, however, attach a less sinister meaning to the tactics of France, which they ascribe to the nervous dread arising from her consciousness of insecurity. But if that be so, surely she would be wiser to conciliate the British people and try to recapture their sympathy, instead of talking and acting in a way that forces them, much against their will, to regard her as a potential enemy.

With the doubtful exception of Belgium, France has not a friend in Europe today. Morally she is isolated almost as completely as Germany was during the war. Whatever motives may lie behind her policy, persistence in it will ultimately and infallibly compel Britain and Germany to make common cause for their own protection.

As Prussian militarism brought the *entente cordiale* into being twenty years ago, so may Gallic imperialism promote in the not distant future an Anglo-German compact that must, in the nature of things, be fatal to the most cherished ambitions of France.

FRANCE

Is the French Navy Imperialistic? Facts for English Naval Men: French Criticisms of the American "Colorado" Battleships: British "Hood" Preferred: Loss of the "Dixmude": Seaplanes v. Dirigibles: Strenuous Training for War.—J. B. Gautreau, *Naval and Military Record*, 30 January, 1924.—The expressions of consternation with which British,

American, and Italian publicists are viewing the simple fact that France intends building six cruisers, together with defensive torpedo craft, within the next five or six years, are to French naval men a matter of amusement and also of wonder. "Oliver is asking for more!" True, Boche propaganda subsidies have been employed to good advantage to create such incredible confusion and such disregard for arithmetical statistics and for ordinary fair play in the minds of the learned and well informed. America, whom no neighbors threaten, and who has in commission the ten finest cruisers in existence, proposes building eighteen more; nobody protests at this determined bid for sea supremacy. By a strange contrast France, the second greatest colonial power in the world, that excelled America in 1914, that sacrificed her fleet to the Allied cause, that wants no new land in the sun and nothing but her treaty rights, is denied the right of looking after her safety: her paper cruisers scare the world!

The 33,000-ton American battleship *Colorado*, that has just visited Cherbourg, has excited much interest and admiration. French observers noted the excellent behavior of the ship in a seaway and the remarkable steadiness of platform due to the disposition, well amidships, of the enormous turrets and guns, and the tremendous amount of armor protecting the submerged central portion against submarine explosions. Another pleasing feature is the abnormally wide deck space available, especially forward, which is very convenient for parades and also for the sending off and landing of scouting *avions*. There are signs that an eventual utilization of this sort of forward deck has been envisaged and prepared for. The good freeboard provided and the spaciousness and comfort (much greater than in the French *Bretagnes*) of officers' and crews' quarters were matters for commendation. In those respects the *Colorados* are thought to be in advance of all European capital ships with the possible exception of the *Hood*. The heavy military tops, or rather houses, surmounting the small Eiffel-Tower-like masts in the *Colorado* remind French officers of the pagoda-like masts of the *Jaureguiberry* and *Carnot* (1893-95), that were at the time in England the object of so much derisive comment. The effect of such bulky masts is to increase the visibility of the target which the *Colorado* would present to an enemy at long range; gunnery specialists consider the fitting of two masts of like size to be an unfortunate blunder that might be paid for at a heavy price in an artillery duel. They note the care with which British designers avoided a mistake of that order in their recent battleships, that have a single rather inconspicuous mast.

The ballistic superiority of the *Colorado* type over all comers is, of course, acknowledged, although the British *Queen Elizabeth, Royal Sovereign*, and *Hood* are estimated to be a match for her in the matter of range, while being rather superior in regard to speed, side protection, and anti-torpedo battery. American designers are seen to have overlooked the vital importance for battleships to train forward as many light guns as possible. Moreover, the defenseless condition of the anti-torpedo armament does not appeal to Gallic naval men who have experienced in the *Prinz Eugen* and *Thueringen* the need of protecting gunners against splinters and poisonous gases.

The strong point in the American mastodon is that she has been made with a view to withstanding the heaviest horizontal attacks by either shells or torpedoes. Viewed from a pre-war standpoint, she is probably unsinkable. Besides, her turrets and conning-towers are fitted with anti-gas and poison appliances, as are also her conning-towers and under-deck compartments. The misfortune is that so much weight has been devoted to big gun and buoyancy protection that the very wide armor decks,

three and four inches thick, would offer no resistance to ordinary shells and bombs dropped by seaplanes, and little resistance to oblique or vertical hits by artillery projectiles fired from long distances. And it is no use disguising the fact that since the Washington Treaty put an end to battleship construction, the *Colorados* stand less chance of ever meeting ships of their class in deadly contest, for which they were meant, than of being confronted by swarms of aerial mosquitoes against which they are practically defenseless, like lions set upon by wasps. Whereas the British *Hood,* when she visited Toulon two years since, found sincere admirers of her speed and aptitudes to rule the wide ocean, the *Colorado* merely impresses observers with the drawback of putting, in these times, too many eggs in one basket.

The dramatic loss of the giant dirigible *Dixmude* is not by any means disheartening the partisans of lighter-than-air craft, who persist in pointing out that seaplanes can never be complete substitutes for dirigibles in the matter of carrying power, fitness for anti-submarine scouting and bombardment, and, moreover, that all preliminary studies have been made already with a view to constructing improved *Dixmudes* of greater structural strength, higher speed, and greater safety in management. It may be recalled that the 1919 program, since revised, provided for the creation of dirigible ports at Orly (near Paris), Marseilles, Algiers, Tunis, and Casablanca. Orly was to be head dirigible training center, as well as repairing and constructing center. Two dirigibles of the improved *Dixmude* type (70,000 cubicK meters) were to be constructed. Unfortunately, the heavy cost (seventy-two million francs—the price of an 8,000-ton cruiser) of this program caused it to be postponed. In May, 1922, on the morrow of excellent tests by the smaller *Mediterranée* (25,000 cubic meters), the Conseil Superieur approved so far as financially possible, of the realization of the dirigible program.

The question of cost and upkeep is the chief obstacle in the way, especially when are reckoned the many powerful *hydravions* of the *Latham, Nieuport, Bleriot, Schneider, Latécoère, Besson,* etc., that could be had for the price of a single *Dixmude,* and that could fly over the Mediterranean without having to fear a fate similar to that of the unlucky dirigible, and also that can land anywhere without the need of hangars and mooring masts. Considering the cost of construction and of upkeep of a 70,000 cubic meter dirigible, its short life and the numerous personnel and the costly plant it requires, it would be possible, and more judicious, for the same amount to have a seaplane flotilla twenty-unit strong and capable of transporting over the Middle Sea some fifty tons of bombs, men, or goods, while offering to attacks a dispersed and far less vulnerable target. In aviation circles, while deploring the loss of Commander de Grenedan and of his gallant comrades, it is felt that the accident to the Zeppelin (which many had foretold) is *un mal pour un bien,* as it will prevent the Admiralty wasting in vulnerable windbags its meager budget that can be better employed in strengthening the fast tried, and reliable *flotilles d'hydravions,* of late rather neglected. Moreover, the natural tendency of designers toward ever greater size must be checked; it has drawbacks rather than advantages, and for obvious reasons. The most reliable motors are not by any means the largest: the wider the span of seaplanes the greater their vulnerability, and the greater also the difficulties of rising from a choppy sea. Again, moderately heavy seaplanes can be fitted with wheels and become land machines for all practical purposes, being capable of landing anywhere, which is a capital asset so far as their military utilization is concerned.

MAKING FRIENDS ON THE CONTINENT: LOSS OF THE "L-24": FRENCH SYMPATHY: LESSONS OF SUBMARINE DISASTERS: TWO CONFLICTING

SCHOOLS OF THOUGHT: ARGUMENTS FOR SUBMARINE MASTODONS: GEOGRAPHY GOVERNS STRATEGY: TRUE ASPECTS OF FRENCH NAVAL PROBLEM.—By J. B. Gautreau, *Naval and Military Record*, 23 January, 1924.—As is patent to competent observers, the 1918 victory has placed France in a worse plight than the 1870 defeat had done, and in a far worse situation than she was in 1914, when the prestige of her immense Muscovite Ally weighed so much in the balance. The hoped-for and promised British and American alliance failing to materialize, France is finding support in other quarters: Czecho-Slovakia (fourteen million inhabitants and Skoda and Vitkovice arsenals under French management) has become her Ally, and France has pledged herself to defend the "Little Entente" (Poland and other Slavic States) against German aggression, a first step toward the restoration of the European equilibrium necessary to peace.

Sincere sympathy is felt with the British Navy in the loss of forty-three gallant seamen who went down in Submarine *L-24* and share with the *marins* of the *Dixmude* dirigible the privilege of having the watery grave that is so often the lot of seamen fighting or training for the defense of "hearth and home." Thus once more are France and Britain united in grief and brought nearer together by the exchange of heartfelt condolences. The anguish of British hearts at the fate of the brave men imprisoned in the hull of the *L-24*, in all probability swiftly drowned or asphyxiated, the French nation has very often experienced in the past, when the *Farfadet* and *Lutin* sank in Bizerta roadstead, when the *Vendemiaire* was rammed by the *St. Louis*, the *Pluviôse* by the *Pasde Calais*, and the *Calypso* by the *Circé*. France has been fortunate enough to have no submarine mishap to deplore since the war, but it is mere luck, for casualties and risks are the unavoidable ransom of realistic submarine preparation for war. Yet it is to be remarked that French submarines, though experimenting, cruising, and training at sea to a greater extent than before the war, are being handled somewhat more cautiously with different objects in view. Fleet attacks at short range and maneuvering en masse, so dear to Admiral de Lapeyrère, are things of the past, and have been replaced by individual and small group training and tactics, well defined sectors of maneuvering minimizing the chances of collisions that make up the greatest dangers for submarines.

Mishaps are inherent to preparation for war, and Great Britain is paying the price for her present submarine supremacy, just the same as France paid the penalty for her superior daring in the dirigible line of enterprise. All the same, Paris experts see important lessons and warning in the *K* and *L* British disasters, and they contend that the policy of "few eggs in one basket" is to be recommended to submarine designers, all the more so seeing that, in the underwater line, size does not mean power but merely increased vulnerability, as shown by the teachings of the Great War, in which the most mischief was wrought by small German submarines. Number is the greatest asset of submarine power, as the chances of hitting enemy targets over the vast ocean are in direct proportion to the numerical strength of submarines on the hunt. Effective blockade of harbors and coasts and the closing of narrow seas by means of moving screens are operations that depend for success solely on the number of submarines at work.

Such at least, is the opinion of a majority of specialists following the lead of Ingenieur Laubeuf, who pin their faith in the smallest submarines compatible with efficiency. Unfortunately, great divergence of views prevails as to the meaning of efficiency and as to the best means of realizing it. Thus, M. Laubeuf, who at first gave 600 tons as the extreme limit of rational submarine displacement, has now extended his maximum up to 1,200 tons—which means that the British *L-24* was well

within the limits he approves. Practice and realistic experience invariably make for increase in size. A steady rise has been noted in the displacement of German underwater craft built in the course of the war; and Boche officers considered as being the most successful those of their submersibles that approximated to 1,000 tons in submerged displacement. In the French service Laubeuf boats of 400-550 tons (*Brumaire-Artemise* classes) are at a discount and held to be too small for anything but coastal work. The smallest units included in the new *programme de sous-marins*, of the *Ondine, Circé, Naiade* types, average 770 tons, and offer conditions of habitability far superior to those to be found in pre-war *Laubeuf* boats.

Those submersibles of the *Naiade* series (twenty per cent buoyancy), of which nine are in hand and four projected are deemed to be *le sous-marin ideal* by those experts who see in the submarine a purely defensive weapon intended to wait for the enemy in the vicinity of French bases and strategic points. Younger and more pushful naval men want to turn submarines into long-distance instruments d'offensive, and profess admiration for the daring designs of the British *X1* and *K's*, that possess the speed and radius of action required for telling offensive in distant waters, and therefore can be reckoned as effective assets of maritime supremacy. Ingenieur Simonot is the chief of that French school of naval thought. Size, it is pointed out, means not only greater usefulness but also additional margin of safety. Armor, watertight sub-divisions, and outward bulges will, to some extent, minimize the effects of collision and mine explosion. Lastly, in large submersibles there is room for life-saving devices (now the object of persevering experiments on the part of enthusiastic submarine specialists) to enable seamen to survive in a sunken submarine and ultimately rise to the surface. In short, small submarines mean stagnation and limited efficiency, and only large submarines may be said to be synonymous with progress.

Geography governs strategy and measures the possibilities of sea power. This fact is sometimes lost sight of even by eminent writers, who compare fleets on paper as if the sea were an open arena in which the various powers can concentrate their ships at will and enjoy equal facilities for maneuvering. Hence, gross mistakes in estimating the relative value of rival fleets. Thus, the great American Armada, though tactically vastly superior to the Japanese in both quantity and quality, is strategically in a position of distinct inferiority that causes French observers to back little Japan against gigantic Uncle Sam, should war break out in the Pacific. Similarly, what was the cause of the Muscovite undoing at the hands of the gallant Japanese at Tsushima? That battle was a mere consequence of the crushing strategic inferiority under which the Czar's navy labored, handicapped by distance and especially by the obligation of having two fleets, if not three: viz., in the Baltic, Mediterranean, and the Black Seas. Any European fleet fighting under similar conditions against the Japanese would have met a like fate. The French for the defense of Indo-China and the American for the defense of the Philippines are nearly as badly situated for the want of strongly-defended and well-equipped offensive bases. And should British economists persist in judging the projected Singapore base not to be worth its estimated cost, the white man must submit to the "inevitable" and consent to play second fiddle in the Pacific.

English naval students who delight in magnifying France's armaments usually forget to take into account the peculiar geographical position of our Republic and her consequent naval disabilities, that had so disastrous an influence on her maritime history. Whereas Great Britain can concentrate the whole of her supreme navy, swiftly and with telling effects, against any enemy and in whatever direction, for the twofold

reason that England is an island and that her worthy statesmen have had the wisdom to making all important straits British; where Italy has perfect freedom of movements in the Mediterranean to defend her shores; whereas America, though handicapped, is at least mistress of the Panama Canal, uniting her Pacific and Atlantic squadrons if needed, France, and France alone, is under the obligation of keeping two distinct fleets, *escadre de la Mediterranée* and *Division du Nord*, that must fight separately and could not unite in wartime. This fact need be noted when comparing French and Italian naval forces.

Taken as a whole, the French Navy is more powerful and also more efficient than the fine fleet of Italy; it has more seamen, more ships and larger, more guns and bigger, and it spends far more in experiments, training at sea, and all-around preparations for war. Should the French Budget and efforts be devoted solely to the Mediterranean, no doubt could be entertained concerning French naval supremacy as regards Italy. Figures, however, work quite differently when it is remembered that half the French naval personnel and fighting materiel (or very nearly) are utilized for the defense of our Northern, Channel, and Atlantic shores, and could not be available in case of need in the Middle Sea. Under present conditions the *Dumesnil* battle squadron may enjoy over rival Italian forces superiority for quality and for range in a ballistic duel (a very unlikely sort of contest nowadays), but it is outmatched in all other respects, for speedy cruisers and for flotillas and even for aerial auxiliaries, for it must be borne in mind that from the situation of Italian islands, peninsular army planes based on Sicily and Sardinia could have a say in a Mediterranean conflict and tend to render communications rather unsafe. Hence French legitimate apprehensions, especially since the Italo-Spanish entente, and determined efforts to remedy a dangerous situation of inferiority.

A further item of inferiority of the Gallic Navy is that part of it must be devoted to the defense of the second largest colonial empire in the world, which reduces the number of ships, especially cruisers, available for service in the Mediterranean. Fast modern cruisers, earmarked for safeguarding colonial communications, must, of course, be based on Brest, for otherwise they would run the risk of being imprisoned in the Mediterranean. Such are the true aspects of the French naval problem.

VALUE OF BATTLE CRUISERS: PARIS EXPERTS HAVE NOT GIVEN UP THE BATTLESHIP: GROWING AERIAL WING OF THE FRENCH NAVY: CONSEQUENCES AND TEACHINGS OF THE "DIXMUDE" DISASTER: WHAT BECOMES OF THE FRENCH DIRIGIBLE PROGRAM.—By J. B. Gautreau, *Naval and Military Record*, 16 January, 1924.—The advisability of including battle cruisers in the French program is always being considered by the Paris naval authorities, who are convinced, from the experience of the whole war, that the command of the sea, freedom of movements, and safe communications will ever be the privilege of superior caliber and speed combined. Should the cost of construction come down, *croiseurs de bataille* would certainly be ordered with a view to increasing tenfold the fighting value of the *croiseurs legers* in hand or projected; and, moreover, it is considered that the logical outcome of the present wholesale ordering of light cruisers of uniform size and power will be the ordering by all great navies of 35,000-ton battle cruisers of 35 knots, to carry six sixteen-inch guns and to be improved copies of the *Renown* rather than of the *Hood*.

Bulges, elastic caissons, bulkheads, watertight compartments, compressed-air reserve devices, and steel net screens, together with other defensive appliances, are being perseveringly studied and improved; and

in expert quarters the opinion prevails that ultimately the heavily-armored, big-gun battleship will be revived in a modified form, with the adjunction of scouting and bombardment seaplanes—although some critics strongly oppose the idea of using battleships as seaplane carriers. In their opinion, all available battleship space ought to be occupied by long-range guns under armor; while fast unarmored light ships are deemed to be right sort of vessels to carry seaplanes. In narrow Mediterranean waters, moreover, it is expected seaplane squadrons based on shore or in islands will always be able to support battleships in action; and, of course, French aerial stations are being organized to that end—no action in the Western Mediterranean or Channel without immediately *escadrilles d'aviation* coming to the rescue; possibilities that somewhat modify strategic problems in Europe.

The French aerial force is gradually being strengthened in conformity with carefully prepared plans providing for the simultaneous extension of training and constructional resources of pilots and of flying machines. Hard experience has shown that efficiency in that branch has far more to do with training methods and with the use of well-tried, moderate sized machines than with number and large dimensions. A great number of mastodon *avions* are under trial that are extremely powerful on paper and very promising, but the *mise-au-point*, the placing of those dreadnaughts of the air in perfect working trim requires plenty of time with careful handling, and, pending the completion of the experiments going on with a dozen giant *hydravions de bombardment* of different designs (carrying from three to seven tons of bombs), the striking weight of the Gallic aerial flotillas is expressed by the number of ordinary service machines in commission: fifty distributed among *ports militaires*; and fifty-five more machines will be delivered within the next few months. This is merely the nucleus of the projected aerial wing of the fleet that is to include ultimately fifty *escadrilles d'éclairage et de combat (Raiberti projet de loi)*. There are only twelve dirigibles in commission, all attached to naval bases with the exception of the *Mediterranée* (25,000 cubic meters), placed at the disposal of the commander-in-chief of the battle fleet. Shortly is to come before the Chambers the debate on the aerial policy of the *Marine Francaise*. Of course, the Navy might eventually have the support of Army aviation that counts about thirty times more machines and pilots. The aeronautical personnel of the fleet only includes 2,800 officers and men, under the supervision of Rear-Admiral Gilly, who is an organizer of tried merit, believing in the value of foresight and of persevering efforts.

The loss of the *Dixmude*, the greatest and most dramatic dirigible disaster on record, has been the occasion for a touching manifestation of Allied fraternity of arms and sympathy. With emotion and gratitude our *officiers de vaisseau* have been reminded that they are far nearer to the hearts of their English and Italian friends than political events and discourses would tend to make them. The behavior of Italian officers and authorities has been handsome, and served to revive Latin sentimentality. The *Dixmude* was a war trophy, and a living symbol of the great Alliance that won the epoch-making contest at sea under British leadership.

Now that all due honors have been rendered to the dead heroes of the air, especially to Commander de Grenedan who possessed the qualities of a chief; viz., tenacity and boldness, the technical and military aspects are being examined of what is, after all, an incident in the manly bid of France for aerial supremacy—and for security. Just like France, other Allies were delivered Zeppelins, but the French alone, by will and researches, succeeded in imparting life to those war trophies in making the *Dixmude* and *Mediterranée* highly-efficient flying machines, in im-

proving in several respects on German designs, in creating, together with a dirigible constructional department, a highly-trained personnel of aeronautical specialists. The question to be solved is whether the fruit of so many efforts is to be lost, whether the French dirigible program, of which so much was expected, is to be abandoned.

Great nations just like great men, far from being crushed by the blows of misfortune, have their will strengthened by them. Moreover, the longevity and survival of nations rest solely upon the readiness of their citizens to run risks and sacrifice their lives. Risks of dirigible navigation that are great (and never can be altogether eliminated) must be faced resolutely if it is recognized that dirigibles possess superior value in war and are susceptible of conferring deciding advantages in a contest. That is the first question to be settled; and before condemning rigid lighter-than-air craft it must be borne in mind that German *chercheurs,* who are by no means Utopians, but of a very practical turn of mind, pin their faith in Zeppelins, the designs of which have perseveringly been improved in Boche (and also in French) laboratories since the war. It is known that Germany, since she freed herself from the Interallied military control, is taking measures for the wholesale construction of super-Zeppelins, that would be entrusted with the bombardment of arsenals and industrial centers too distant from German aviation headquarters to be reached by bombardment planes. On the other hand, those experts who tested the capabilities of the *Dixmude* and *Mediterranée* for fleet work and strategic missions have expressed the conviction that seaplanes are no substitutes for them.

In these matters experts alone must decide, not armchair critics, not emotional public opinion unduly impressed by unavoidable loss of lives, that is the ransom of progress. Popular journals have been clamoring for *commissions d'enquête* and for sanctions and penalties. This ridiculous agitation can do nothing more than create confusion and prevent the real issue from being seen. Under such circumstances, verbiage by those who do not know, who feel but do not see, is nothing but senseless waste of time, as shown by the several *commissions d'enquête parlementaires* that come to precarious and useless life on the morrow of the *Jèna, Liberté,* and *France* disasters. As the meetings of the Jèna Inquiry Committee dwindled on, for instance, they were attended by—the sole chairman, who was Monsieur Clemenceau! Truly comedy is out of place in tragedies.

Once the pursuance of the dirigible program has been decided upon, the second theme to be studied comprises the cause of the *Dixmude* disaster and the question of the measures to be adopted to minimize risks. Uncertainty prevails up to the present: the great dirigible exploded, having probably been struck by lightning. That risk will be reduced by the adoption of non-inflammable gas and of special protective devices. A second version (not very plausible) is that the dirigible under the strain of the tempest broke in its center, sharing a fate similar to that of the last British dirigible. It is rightly pointed out that in the fury of the storm that raged for a week over North Africa, hangars at Algiers and Bizerta would have been of no use—though a "mooring mast" of the British type might perhaps have proved serviceable. A last argument against the Admiralty is the *Dixmude* ought not to have been allowed to start on its cruise in the face of threatening atmospheric conditions. A meteorological information service is to be organized under Commandant Rouch, a hard-working specialist of repute.

GERMANY

GIANT SUBMARINE IS HEART SHAPED. CROSS SECTION OF NEW FLAMM BOAT RESEMBLES HEART WITH POINT UPWARD.—N. Y. *World*, 19 January, 1924.—Berlin, January 18.—The new giant submarine cruiser, designed by Professor Oswald Flamm, as told exclusively in dispatches to *The World*, solves the problem of stabilization, which the inventor says is the chief obstacle to great size and cruising radius, by its shape and construction, not by ballast.

In shape, *The World* learns today, it resembles in cross section the conventional heart, point upward. The keel is built along the groove that thus runs along the bottom of the vessel, the sides of which bulge out on either side of the keel line. The body of the craft is rounded up to the point where the bulges reach their lowest point. From here to the keel the line is straight, so that the groove of the heart is an inverted V.

Professor Flamm planned the bigger submarines Germany built toward the end of the war, but he had a long fight with Admiral von Tirpitz, commander of the fleet, before they were adopted, *The World* learns. Without Flamm's invention the submarines would have been unable to make their long raids.

"Stabilization," Professor Flamm declared, "is obtained by the form of the body and pressure on the submarine. The first submarine I built on the new theory by which I discarded ballast and other forms of stabilization was in 1920 and was a vessel of 1,443 tons. The biggest German submarine during the war and the biggest anywhere during the war displaced 1,100 tons.

"I have been working ten years on submarine construction, and as a result of studies lasting three years I succeeded in constructing a model of a new type which shall be 525 feet long, forty-nine wide and thirty-two deep, a submarine cruiser of 7,067 tons.

"The French in their new naval program have only 3,000-ton submarines. I do not know how long the French consider it will take to build theirs, but to build mine will take a year in the best equipped shipyards. The same time is necessary for constructing a submarine minelayer of 7,700 tons. The French or Italians could construct perhaps ten in a year in the shipyards they possess. The British could build fifty.

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FRENCH FEARS OF GERMAN AIR POWER.—*The Literary Digest*, 26 January, 1924.—Real fright has been awakened in the French mind, it appears, by the subtlety and sweep of Germany's alleged preparations to come back at France from the air. One indication of panic, which is said not to be a customary quality of the French, was a patriotic demonstration arranged by the *Echo de Paris* in the amphitheater of the Sorbonne, at which various high officers of the French Army assisted and spoke. The Paris *Temps* says flatly that in Germany aviation is considered commonly "a marvelous instrument of revenge," and the promoters of this idea are reported to have organized "a vast propaganda for the conquest of the air, a propaganda that reaches from the schools to all classes of German society."

The Paris *Gaulois* points out that because certain clauses of the Versailles Treaty prevent much of the activity in aircraft that the Germans would like to indulge, they have tried to make profitable use of certain loopholes in that document. For instance, this daily notes, the Treaty permits the building only of air machines of minor power, capable of planing at a low level, so the Germans put all their hopes in sport aircraft to be built according to the type permitted by the Treaty. We are advised also that the German Scientific Society for Aerial Locomotion

is encouraging in every way to building of sport airships, and that it has circularized all builders of such machines, urging upon them that Germany must occupy the first place in all the world in the construction of such sport aircraft. This company, we are told, allows the widest latitude to aircraft-builders, but suggests that all machines should be of thirty-five horsepower to eighty horsepower with a range of 900 miles; that they should be capable of being quickly dismantled and set up anew on carrying surfaces so as to eliminate the need of hangars; and finally that they should be so built as to be transformable from an airship with motor to an airship without motor. *La Gaulois* assures us that the real purpose of this company is, with the backing of the German Government, to erect in all parts of the Reich aviation factories for the making of sport aircraft which can not be prohibited by the Committee of Guarantees on the Treaty. But, it adds, as soon as the obligations of the Treaty have ceased, Germany will be well supplied with aeronautic equipment to enable her to begin immediately to build war machines. In the meantime the pilots and crews of the sport machines will have been thoroughly trained as an air reserve. Such an eventuality is not immediate, this Paris daily concedes, but it is imperative that France stimulate its activities in air science against the day air knowledge and power may be a vital necessity.

Another development of German air progress that disquiets the French, we learn from the Paris *Matin*, is the amalgamation at Munich of several air companies under the title of the Trans-Europa-Union, as a company of international air transport designed to organize, between 1924-26, a system of airlines bringing into contact the remotest points of the European Continent. According to this Paris daily, the enterprise is trying to secure a monopoly of air navigation in certain countries, and it tells us that there are seven companies in all, of which four are German. This newspaper names them as follows: Aero Lloyd, Rumpler, Junker, and Bayerische; Ad Astra, a Swiss Company established with German capital; the sixth company, unnamed, is Austrian; and the seventh, also unnamed, is Hungarian. But they are all "practically German air organizations." The system of routes as planned is thus detailed:

"1. London-Continental Line: (a) London-Rotterdam-Bremen-Hamburg-Copenhagen-Malme; (b) London-Rotterdam-Berlin-Koenigsberg-Kovno-Smolensk-Moscow; (c) London-Rotterdam-Berlin-Koenigsberg-Riga-Reval-Petrograd; (d) London-Rotterdam-Cologne-Strasbourg, with two branches, one leading to Athens and Smyrna through Zurich, Genoa, Rome, Naples, and Brindisi—the other leading to Central Africa through Athens.

"2. North Europe Oriental Line: This system will include except for certain regions served by the lines of the foregoing system, a line to Stockholm-Reval-Petrograd-Archangel; and three lines toward the Near East, Central Asia, and Siberia; Archangel-Petrograd-Moscow-Kieff-Odessa-Braila-Constantinople-Edremid-Smyrna; also Kaikov-Rostov-Novorossisk-Batum-Tiflis-Bakou-Teheran; and Samara-Tsaritsine-Astrakan-Baku-Enseli-Teheran.

"3. South line: Its center will be at Lisbon and it will include—Lisbon-Braila-Via-Marseilles-Genoa-Trieste-Belgrade and Bucharest; also Lisbon-Trieste-Vienna-Glaiwitz-Warsaw-Smolensk, with connections to Siberia and China; also Lisbon-Madrid-Bordeaux-Paris-Cologne-Berlin-Danzig-Koenigsberg-Riga-Reval-Petrograd.

"4. Central and Balkan line: The termini of this line will be at Berlin-Cologne-Lyons-Athens and Constantinople."

The *Matin* observes that with this organization the Germans are enter-

ing into competition with companies already operating in Western Europe and in Central Europe, despite the fact that the vast field of Russia is open to them; but they are said to be counting on making agreements with these earlier organized enterprises in order to realize their projects. According to the Paris *Eclair*, the Germans have succeeded "after long and difficult negotiations" in putting under way the plan of an air-line from Seville to Buenos Aires, which is said to have as objective "an understanding between Germany and Spain and the Argentine Republic." This daily, in common with other French journals, declares that "Germany is displaying extraordinary activity in all matters of aerostation; and whether it is a question of air-lines that stretch above every country and reach as far as Moscow, her progress and projects in the air over land and sea are in no way chimerical, and their swift realization may one day surprise us." In the Paris *Courrier du Parlement*, Jacques Mortane, an expert on aircraft and science relates that German air companies have signed agreements on air navigation with several foreign countries, and he proceeds:

"Before long we shall feel the effect of German air activity, and therefore now more than ever we should encourage our air industry, if we do not wish to see the heavens darkened with the web of the German spider.

"Let us work unceasingly and let us work with all our might. Let us not be puffed up with our own merit, nor underestimate the qualities of our adversary. Let us not seek to condemn their redoubtable air equipment, for the time is past for that. We have let our chance to surpass them go by, and the weight of this criminal error should fall upon the guilty who deserve it. This is not the moment for discussion, because we are face to face with realities, and to banish the peril we must work. We must improve our methods and our material. We must get the masses interested in aviation and give every facility and advantage to the builders of air-lines and those who develop them."

Allied Extravagance At Germany's Expense.—By Hector C. Bywater, Baltimore *Sun*, 16 February, 1924.—London, January 24.—No clause in the Versailles treaty has been more bitterly resented by the German people as a whole than that which condemns them to pay out of their own pockets the cost of the foreign armies of occupation.

On the other hand, no clause in the treaty met with heartier approval from the Allied nations at the time of its insertion. To them it seemed poetic justice that Germany should be compelled to reimburse her conquerors for the expense they were put to in guarding against a repetition of the war that she had wantonly provoked.

For let it not be forgotten that the original purpose of the occupation was not so much to put pressure on Germany for the discharge of her war debts as to discourage her from attempting further resistance. When Marshal Foch failed to obtain the support of the Peace Conference for his drastic scheme of annexation—which would have given France a permanent frontier on the Rhine—he compromised by suggesting the occupation of the river bridgeheads for a long term of years, an alternative promptly accepted by the British and American delegates, who had been taken aback by the sweeping nature of the first French proposal.

Marshal Foch argued that peace would be secure as long as foreign armies were established on German soil, because Germany never went to war unless she could count on all the fighting being done outside her own borders. This was the guiding principle of German strategy in the three successive wars of 1866, 1870-71 and 1914-18: a sudden thrust with irresistible force that would carry her armies deep into hostile territory,

where they could dig themselves in with the comforting reflection that all the havoc and devastation inseparable from war would be confined to the enemy's property.

The principle is sound enough if victory is assured, but Germany was a little too confident on the last occasion, and she has since learned, to her cost, that the weapon she wielded with such terrible effect is double-edged. Let her so much as make a gesture of active resistance to her present masters and she will inevitably experience all the worst horrors of modern warfare—and horrible they are, indeed—on her own soil, which German writers, in defiance of history, persist in calling "sacred and inviolate."

To tell the naked truth, nothing would please the French more than that one of the numerous German Nationalist plots now brewing should come to a head. Human nature being what it is, there are millions of Frenchmen who passionately regret the Armistice, which robbed them of the chance of doing unto Germany what she had done to them.

The systematic devastation, "for military reasons," of thriving cities and fertile countryside is a game at which two can play, as the Germans would have been made to realize had they not capitulated in the nick of time.

As it is, France is resolved that if she ever has to fight Germany again the zone of war shall be confined strictly to the Fatherland and she believes that so long as her grip on the Rhine is maintained she will be safe from attack by her arch-enemy, who has too vivid an appreciation of the terrors of war to bring them to his own door.

But, although the saner elements in Germany do not dispute either the justice or the legality of the Rhine occupation, they claim that France and Belgium are shamefully abusing their powers. They have, it is alleged, seized the opportunity to transfer a great part of their respective armies to the Rhine, there to be fed, housed, trained and administered at Germany's charge.

According to official German statistics, there are approximately 100,000 French and 30,000 Belgian troops in the occupied regions, not counting the Ruhr. This is practically double the present strength of the German Regular Army, which consists of about 70,000 men, distributed over twenty-eight garrison centers.

A memorandum issued by the Berlin Treasury draws a striking contrast between the sum that Germany spent on her own armaments before the war—including a military establishment of 800,000 troops and a battle fleet of five dreadnaught squadrons—and that which she is now forced to pay for the upkeep of these foreign armies. From 1910-13, inclusive, her total army and navy budget amounted to 3,789,000,000 gold marks; while from the Armistice to the end of December, 1922—that is, a corresponding period of four years—she was mulcted in 4,500,000,000 gold marks for the costs of the Allied military occupation.

Even when the reduced purchasing power of the gold mark compared with pre-war days is allowed for, these figures are still very impressive, not to say startling.

The Treasury memorandum proceeds to draw attention to the arbitrary manner in which the Franco-Belgian authorities have taken over large tracts of land in the Rhine area for the use of their troops. The old German garrison in this district occupied 6,509 hectares (259 hectares are equivalent to one square mile), including all rifle ranges, drill grounds and riding terrain. This, however, did not content the newcomers, who have commandeered a further 3,886 hectares for the like purpose, besides taking 907 hectares of the best agricultural land for use as military aerodromes, of which a whole chain now extends along the Rhine.

The billeting expenses claimed by the Franco-Belgians are declared to be abnormally heavy. As the memorandum remarks with caustic irony: "The obvious aim is to give as many relatives of the Belgian soldiers as possible an opportunity of setting up housekeeping at Germany's expense."

In certain parts of the occupied zone the cost of billeting officers' families increased fifty per cent during 1922, perhaps because of the generous interpretation placed upon the word "family." The example is cited of one unmarried Belgian officer who is allowed a suite of five handsome apartments, wherein he dwells in company with his grandmother, his mother, an unmarried and a married sister and the latter's two children, and the entire expenses of this establishment are debited to Germany's account.

Lists are given of typical requisitions made by the armies of occupation, which have demanded and received from the German Government enormous quantities of household furniture, including children's cots and ladies' boudoir equipment and enough bed linen to make a strip, several feet wide, that would extend from London to Naples.

Of the nineteen milliard paper marks (assessed when the exchange rate was 1,800 to the dollar) which Germany has had to pay for land and buildings taken over by the forces of occupation, sixteen milliards were for the benefit of the Franco-Belgians. In the year 1922 the bill for heating, lighting, water supply and other domestic services came to 622,000,000 marks; stationery cost 170,000,000; mail, telegraph and telephone fees, 33,000,000, and railroad transport, 258,000,000 marks.

This is only part of the price that Germany must pay for the privilege of entertaining her foreign garrisons. When French troops occupied Duesseldorf, Mulheim-on-Ruhr and Duisburg, in pursuance of the military sanctions imposed for default, a bill of 3,300,000,000 paper marks was presented to the German Government to cover the cost of this expedition and was duly paid.

As these facts and figures have not yet been challenged in any quarter, we must assume them to be accurate. They certainly seem to warrant Germany's protest against the enormous expense of the Allied occupation. Many of the items, in fact, are suggestive of downright graft, to call it by no stronger name.

Germany thinks she has further ground for complaint in the cost of the Interallied control missions, which have lately resumed their work after months of comparative inactivity. These missions, she declares, are placing a far heavier burden on her resources than is commonly realized. Up to the end of 1922 their maintenance had cost her 2,200,000,000 marks, a large percentage of which went in pay and allowances to the personnel of the missions. In that year French privates serving in Germany were paid on a higher scale than German secretaries of state. A French non-commissioned officer drew 341,250 marks a year, while a German general had to be content with 196,000 marks.

Is it any wonder that the German masses should regard these extortions as proof of a Franco-Belgian conspiracy to pillage and ruin their country? The rapacity shown by officers and officials of the occupation armies has done almost as much to inflame German wrath as the seizure of the Ruhr. The whole question is one that calls for a searching investigation, though by whom that investigation should be made is not easy to say. An inquiry would certainly not be welcomed either by the French or the Belgians.

Were Germany a member of the League of Nations, she would have a strong case to lay before that body, but since she is not a member the league, if appealed to, would in all probability disclaim jurisdiction.

One thing, however, is certain: The military occupation of the Rhine-

land was a measure decided on as a guarantee of peace, not as a pretext of saddling Germany with enormous costs additional to the bill for reparations. If, as the facts suggest, this measure has been perverted to illicit uses, the German people are not to be blamed for holding the Allied and associate powers individually and collectively responsible for what has happened.

JAPAN

JAPAN'S NAVY BUDGET NOT RUTHLESSLY CUT.—OTHER GOVERNMENT DEPARTMENTS HAVE BEEN FORCED TO ECONOMIZE, BUT NOT ONE SHIP HAS BEEN DROPPED FROM NAVAL PROGRAM.—By Hector C. Bywater, Baltimore *Sun*, 26 January, 1924.—London, December 27.—When the first accounts of the Japanese earthquake came over the cable and every succeeding message emphasized the frightful destruction of life and property which had been caused, many people who should have known better jumped to the conclusion that Japan had ceased to exist as a great power.

"In the course of a few hours," wrote one of the leading London journals, "the work of a generation has been wiped out. Virile and energetic as the Japanese people have shown themselves to be, they can hardly be expected to recover from this overwhelming blow in less than a decade. For that period at least Japan must renounce her imperialistic ambitions and devote all her energies to national reconstruction. So far as world affairs are concerned she has ceased to count as a dynamic factor. The most sanguine estimates place her minimum period of recovery at ten years, during which time she must be content with a back seat in the concert of nations."

These extracts fairly summarize the views of a large section of the European press. It was too hastily assumed that the destruction of two great Japanese cities meant the destruction of Japan. In foreign eyes the power, prestige and wealth of Nippon centered in the capital of Tokio and the seaport of Yokohama.

But it was not long before the western world had occasion to modify these first impressions. The reaction of the disaster on Japan's economic system proved to be much less severe than had been anticipated. It soon came to be realized that the country, despite its terrible losses, was far from being paralyzed, or even crippled.

Generally speaking, the people had behaved splendidly. Here and there, it is true, symptoms of popular hysteria manifested themselves in the form of bloodthirsty violence. Many Koreans were slaughtered, and there was more than one brutal murder of political prisoners by police and military officials.

But before condemning the Japanese as barbarians on account of these excesses, let us remember the pre-war pogroms in Russia. There are superior people here and in the United States to whom a cultured Japanese gentleman is a heathen in outer darkness compared with the Russian *moujik* and who would raise their hands in horror at the suggestion that the humbler classes of Japan are no less civilized than those of Russia. All the same, the Japanese proletariat has shown greater restraint and a finer spirit of humanitarianism under provocation than was evinced by the Russian peasants portrayed by Tolstoy, Turgeniev and Gorki.

According to statements made at a meeting of Koreans held in Shanghai some weeks ago, 5,000 Koreans were butchered in the devastated zone during the week following the earthquake. The Tokio Home Office declares, however, that not more than 1,200 Koreans were massacred and that eighty per cent of these were shot or cut down in the very act of pillage.

We shall probably be safe in estimating the number of Koreans actually killed at somewhere between 2,500 and 3,000, of whom a certain proportion were undoubted malefactors who richly deserved the fate meted out to them. But consider the provocation, real or imaginary, which the mobs who hunted down these wretched victims could plead.

For years past the Japanese press, with a few honorable exceptions, has been stirring up popular feeling against the Koreans. Whenever a particularly brutal crime was committed and the police found themselves at fault, the criminal was nearly always assumed to be a Korean—a word, indeed, which has become in Japan the synonym for a malefactor of the deepest dye. No public building could be destroyed by fire, no statesman or prominent man could be assassinated, no case of murder or even of housebreaking could be perpetrated without the newspapers attributing the deed to a Korean.

When Premier Hara was stabbed in November, 1921, his assailant was described in the first reports as a young Korean, though the true identity of the assassin—a full-blooded Japanese—was known immediately. Is it surprising in these circumstances that the mob in Tokio, Yokohama and other places in the Kwanto region should have swallowed the stories, put about after the earthquake, that Koreans were systematically murdering the injured, looting the wrecked buildings and even poisoning the wells from which the survivors drew their water?

That the ferocious treatment of these Koreans, who were innocent of offense and whose only crime was their nationality, is a dark blot on the Japanese escutcheon, no honest friend of that country can deny. But the outrageous conduct of the few ought not to blind us to the fortitude and heroism of the many. Most eyewitnesses agree that, considering the magnitude of the catastrophe and its horrifying features, the absence of panic was remarkable.

The Government set an inspiring example of coolness and serenity in the hour of trial. Thanks to the vigorous measures taken by the new Cabinet, the administrative machinery was set in motion again a day or two after the earthquake. In less than a week's time a far-reaching scheme of reconstruction had been drawn up and a start made in carrying it out.

Only four months have passed since then, but the restoration of the shattered cities is in full swing, and outside the actual zone of devastation life in Japan has reverted to the normal. The forecast I ventured to make in these columns last September, that the earthquake would not seriously interrupt the development of Japanese policy at home and abroad, has already been fulfilled.

The domestic political situation has undergone no visible change. In view of the tremendous cost of reconstruction large economies have had to be effected in state expenditure, but it is noticeable that the military budgets have been retrenched far less drastically than those of the civil departments. The monetary loss to Japan is not represented solely by the destruction of private and national property.

During the current fiscal year, there will be a deficit of about $100,000,000, caused by the diminished returns from taxes and other sources of revenue, and a still heavier loss is regarded as inevitable next year. The outlook would be extremely serious if the financial position of the country were less stable than it is.

But though Japan is in no danger of becoming bankrupt, it will take years of thrift to restore her finances to their former healthy condition. A study of the first earthquake budget indicates very clearly the Government's reluctance to economize on the fighting forces. While schemes for developing railroads, roads, telegraphs, telephones and other public services

have been ruthlessly curtailed and in some cases entirely scrapped, the navy and army budgets have been pruned with a gentle hand.

Under the normal estimates for 1923-24 a sum equivalent to $139,000,000 had been set aside for the Navy. This has since been reduced to $119,500,000, a cut of only $19,500,000. The Army has fared still better, for its original budget of $102,500,000 has now been amended to $99,900,000, a reduction of only $2,600,000.

The press is by no means satisfied with these cuts and for once is absolutely united in urging the Government to overrule the soldiers and sailors. But with a retired naval officer as Prime Minister, and with militarist influence predominant in his Cabinet, it is scarcely to be expected that these newspaper criticisms will have any effect.

Both the War and Navy Ministers have threatened to resign if their respective departments are further retrenched, and as these two functionaries command between them the all-powerful support of the Choshu and Satsuma clans, any attempt to defy them would speedily wreck the Government.

One item in the revised naval budget which has given rise to much adverse comment is the fund for restoring the damaged naval base at Yokosuka. No less a sum than $40,000,000 is to be spent on this object during the current fiscal year. As one Kobe journal points out, the feverish haste with which the Yokosuka war base is to be repaired might be intelligible if Japan were faced with the contingency of an early war, but seeing that the political horizon is cloudless and likely to remain so for the next few years it is difficult to think of a rational explanation of this frenzied hurry.

It is not as if Yokosuka were the only big war port available for the Japanese Fleet. There is a still larger navy yard at Kure and smaller establishments at Sasebo and Maidzuru. These three yards would be more than enough to accommodate and maintain the reduced fleet to which Japan is entitled under the Washington Treaty.

Criticism is also directed against the Government for its decision to keep the naval construction program intact. In a dispatch to *The Sun* dated September 5, I wrote as follows: "Possibly, however, the overpowering disaster which has befallen the country may lead to some modification of this ambitious shipbuilding project. The cost of making good the damage caused by the earthquake will be staggering, and it is scarcely conceivable that further expenditure on military objects will be sanctioned until considerable progress has been made in restoring the devastated areas of the empire."

The inconceivable has happened, however. Not a single ship is to be dropped from the program, which remains exactly what is was before, except that the period it covers has been extended by twelve months. If additional proof had been needed of the strength of Japan's determination to preserve her military supremacy of the Far East, that proof is now before us.

UNITED STATES

PROBLEMS OF DEFENSE IN PANAMA CANAL ZONE.—RESISTANCE TO LANDING FORCES, PROTECTED AREAS FOR FLEET DEPLOYMENT AT EACH CANAL TERMINUS AND DEFENSE AGAINST AIRCRAFT ARE DISCUSSED.—By Captain Dudley W. Knox, U. S. N. (Retired), *Baltimore Sun*, 30 January, 1924.—Washington, January 24.—The telegraphic reports from Panama of the joint army and navy maneuvers, just concluded, are too brief to warrant more than very general deductions being made at this time. Apparently the existing defenses are insufficient to serve several important purposes. The garrison of troops is too small to be sure of holding the isthmus

against hostile landing forces; the Atlantic end of the canal, including the Gatun Locks, seven miles inland, is not secure against possible bombardment from seaward, and the shore terminal defenses do not assure the fleet a safe exit when passing into the Atlantic.

The loss of the canal to an enemy might readily result in national defeat. If captured by an Atlantic power while our fleet was in the Pacific, the whole east coast of the United States would be open to attack. Even if we escaped invasion and the bombardment of seacoast cities, it would be certain that seaborne commerce from our ports would come to a virtual stop, and that freight blockades and the shutting down of factories would bring privation and suffering to millions of citizens.

The converse case of vulnerability on our Pacific Coast is easily imagined. But worse than either of these situations would be one in which the canal was captured while our fleet was divided with a part in each ocean. Concentration of the two separated detachments would be impossible and each would be imperiled by a united enemy. Under such circumstances, both coasts would be in jeopardy.

Of course, theoretically, it would be bad strategy to have our fleet so divided in the first instance, and one might argue that this illustration is therefore somewhat far-fetched. It is; and yet it is rather the rule than the exception in war that the unexpected happens. Theoretical dogmas often need to be violated to meet peculiar circumstances.

In any event, no one will dispute the wisdom of American naval strategy, based upon local defenses at Panama so strong that the isthmus cannot be taken from us. Otherwise a great part of the fleet must be diverted to the local defense of the canal, and kept from its legitimate rôle of protecting our coasts and sea communications and of carrying the war into enemy waters. A weakly held canal would hamstring our naval strategy.

The most fundamental requisite to insure that the isthmus shall remain in American hands is a sufficiency of troops. The coast line adjacent to the canal is long and many places favorable to the landing of small boats are to be found.

These all must be defended, since it is easier to prevent a large force from landing than it is to defeat it afterward. Once ashore in largely preponderant strength, the enemy will soon have the use of the canal for his own naval forces. This is why the report regarding the recent maneuvers that "the mobile land forces are insufficient" is most disquieting.

Closely related to the question of the number of mobile troops is that of roads. Before it is known what point the enemy has selected for a landing, the defending troops must be dispersed to guard all possible landing places. They cannot all be held in great strength. Once the attacking force has shown its hand and committed itself to one locality, reinforcing troops from other places must be rushed to the region of danger.

An adequacy of roads means a vital saving of time; and time saved under such conditions is the equivalent of having more troops in the whole area. It is reported that strategic roadways on the isthmus are inadequate for purposes of defense. Manifestly this important deficiency should be rectified.

Sufficient mobile troops will prevent an enemy from capturing the isthmus; but, unless supplemented by an assortment of other forms of defense, the troops cannot prevent an enemy fleet from rendering the canal practically useless to all American forces—either through damage by bombardment to the canal works or through denying our ships a safe exit from the canal terminals.

Some of the telegraphic reports of the recent maneuvers go so far as to state that even the Gatun Locks, seven miles inland, may be placed under

long-range bombardment by hostile ships without substantial danger to the latter from shore batteries. The destruction of these locks would wipe out the canal itself.

Apparently the original installation of coast-defense guns have not had their mounts altered to meet the modern requirements with respect to high angles of elevation so as to obtain long-range fire. It may be that some of the guns should be replaced with more modern ones of greater power. In any case, the fundamental necessity of modernizing defending guns so as to afford proper protection to the canal works is too manifest to require any argument.

But from the naval viewpoint something much more than the preservation of the canal itself is required of the local defenses. The fleet must have protection in the terminal ports and protected sea room beyond the terminal ports, in order to permit deploying and forming up for battle before feeling the weight of hostile fleet fire. The local defenses must, therefore, be reasonably effective for a considerable distance to seaward.

It requires many hours and a great tactical dispersion for the fleet to make a transit of the canal. In the narrow and shallow confines of the canal ships cannot proceed at high speed, nor can they follow each other as closely as they do at sea. The first ship to emerge necessarily will have a long wait before the fleet as a whole can get within supporting distance of her. If the passage is pushed in the face of opposition, each ship arriving at a weakly defended terminal is likely to find that the preceding ships have been sunk there in succession and that it is merely her turn to take the same medicine.

The problem of emergence from the terminal ports is very similar. There must be time and room within protected waters for the fleet to get into battle formation; with capital ships close together and turned to present broadsides to the enemy, and with cruisers, destroyers and other auxiliary craft several miles in advance to deliver or guard against mine and torpedo attacks. Otherwise the tactical disadvantages under which our fleet must operate may easily outweigh a paper preponderance in strength and cause its defeat by a theoretically much weaker enemy. The problem of passing our fleet through the great canal against resistance is closely analogous to that which confronts an army when desiring to cross a bridge or to advance through a narrow defile. The formations imposed by the conditions of transit prevent effective fighting until deployment in force has been made well beyond the narrow exit.

Under modern conditions the best protection to what might be termed the "deployment" area, beyond the canal terminals, will come from a combination of several forms of warfare. Long-range, highpower artillery and mobile troops should be supplemented by air power and sea power. Bombing and torpedo planes are required and need the co-operation of observation and fighting planes. We should have enough American submarines to deter an enemy from getting too close to the limit of coast-defense range, and enough mines to make remote landing places uninviting to him. Antisubmarine craft are necessary to prevent hostile submarines operating in or near the terminal ports against our ships.

The whole problem of the local defense of the great isthmus so as to insure it against being captured, and also to be certain that it will continue of use to our ships in spite of hostile naval opposition, is one in which all the elements of land, sea and air-power have to be employed in strength and duly co-ordinated.

THE PANAMA MANEUVERS.—*Boston Transcript*, 28 January, 1924.—The joint Army and Navy war games just held at Panama teach to thoughtful Americans a lesson that they will wish to take to heart. For aside

from the commercial advantages accruing to the nation that built the canal, that owns it and that is responsible for its defenses, the enterprise was carried to completion in the confident belief that an Isthmian Canal at that point would permit a quick concentration of the nation's naval forces on either coast. A way for such mobilization is provided by the Canal. The result of the war game just ended demonstrated that an active enemy, even with an inferior force, can deny the use of the Canal to the American fleet.

There have been a number of previous problems involving attacks on the Canal but there have been none that we recall which have gone to the heart of matters as this one has. In former years frontal attacks have been made on the defenses, or long-range bombardments of the locks, or other such efforts at capture or injury which many military men have said are not likely to occur in time of war. Mark the totally different character of this problem: Suppose that war has been declared by an Atlantic power, and that the major portion of our Navy is in the Pacific. The Black Fleet is powerful enough to isolate and hem in on our Atlantic coast the small portion of our fleet which is there, and also able to detach a force of ships to the Caribbean. This Black Fleet in the Caribbean is less than half the size of our Blue Fleet which is en route from the Pacific coast. The problem then is for the Blue Fleet to make the passage of the Canal against the opposition of an inferior enemy in the Caribbean.

As the game developed the Black enemy succeeded in doing a number of things which he might have been prevented from doing. That is, he landed a force of marines and captured Fort Randolph, the submarine base, and the Army and Navy air stations, besides theoretically sinking a blockship in the canal entrance channel. All of these things might have been prevented, but they are all relatively unimportant. The really important fact demonstrated by the problem was the inability of the superior Blue Fleet to safely transit the canal and form battleline against its inferior opposing Black enemy. The Black Fleet was able to cruise off the entrance to the canal in battle line with every big gun bearing on the canal channel, safely out of range of the guns from the forts, and yet able to open fire on the Blue ships as they came within range one by one in the canal. The Blue ships were, of course, unable to maneuver while in the canal and they could fire only their forward guns. As a result, despite the superiority of the Blue Fleet, its ships were sunk one at a time before they reached the open sea, without an opportunity to engage the enemy upon anything like equal terms.

The canal defenses should be designed with two main objectives. First, they should be capable of defending themselves against a landing party, or against a surprise party of troops.

Second, they should have guns capable of holding an enemy fleet at such a distance as would permit our fleet to pass through the canal safely and form battle line in the open sea. Unless the fortifications at Panama meet these specifications they are not really protecting the canal.

CANCELLING THE POLAR FLIGHT.—*Boston Transcript*, 18 February, 1924. —The President's decision that the *Shenandoah* should not set forth on a voyage of Arctic conquest without the express authorization of Congress almost certainly means that the flight will not be attempted this year. Under all the circumstances the cancellation is to be commended. But it should have come as a direct announcement from the commander-in-chief. Admitting that the hazard of the trip would have been relatively slight and that the chances would have been strongly in favor of a safe return, there exists no emergency which would justify rushing into the enterprise with a ship so new. Captain Bartlett's flamboyant statements before a con-

gressional committee may properly be accepted with some reserve, for although Captain Bartlett is pre-eminent as an authority on the Arctic he can hardly be given equally high rank as an airship expert.

The rigid airship is still on trial, and demonstrations of reliability and safety and practice in handling, both in the air and on the ground, are of far more importance than any single spectacular flight. The vital need now is to get data for the improvement of future designs, and reliable information on the proper field of service and the degree of usefulness of airships both in war and in commerce. The Polar flight would have contributed little in those directions.

A dozen undertakings more useful, if less sensational, can be suggested. The *Shenandoah* has not yet been to sea with a fleet, and has been given no test under conditions approaching those of war-time service. When ships have been fitted with mooring masts it should be possible for an airship to remain at sea almost as long as the fleet itself, tying up to a mast and taking on fuel from below. Experiments at least leading in that direction should be tried, and they can be tried on the North Atlantic coast without ever going a thousand miles from the Lakehurst hangar during the early stages. Then, too, a reliability test such as would be afforded by a prolonged series of weekly round trips between Lakehurst and Chicago, for example, on a regular schedule would supply information invaluable both to the General Board and the Bureau of Navigation, who want to know how far airships can be relied on for continuous service under all sorts of conditions, and to airship designers, who are anxious for more data on operating difficulties, data which can only be obtained from actual operating experience.

An Arctic journey would do these things no better than a series of flights within the confines of the continental United States and close to its coasts, and if any trouble should arise it would be very desirable that the ship be within a reasonable distance of its hangar. The happy outcome of last month's accident at the mooring mast afforded a remarkable demonstration of the strength and airworthiness of the ship, but it must not be forgotten that there might have been a less pleasant story to tell if the ship had broken away from a mast somewhere near Nome and had had to travel five thousand miles to get under cover where repairs could be made. That particular mishap should not occur again, but something else might conceivably go wrong. Furthermore, repeated trips of moderate length from Lakehurst will permit of complete and detailed inspection after each flight, and operating and service reports can be much more complete than would be possible under the conditions attending the trip to the Pole. Finally, a long series of short trips will afford the best and safest means of training a crew and officer personnel largely changed within the past two weeks.

The new Arctic continent, if one indeed exists, can wait another year for mapping and pre-emption. Its investigation offers a problem very attractive for explorers, but the *Shenandoah* was not built as a tool of exploration. Her direct value as an experimental airship is too great to justify tests of which the principal alleged value is indirect and in another field than that of airship design and operation.

Why President Coolidge, with abundant reasons before him for holding up the flight, should have tried to shift to the Congress a responsibility that constitutionally belongs to him as commander-in-chief is a question that his well-wishers far and near will be hard put to answer. Within the week he had, with a fine sense of his constitutional duty, protected the premises of the executive from a raid by the Senate. Now he invites a raid by both Houses of Congress upon his authority as commander-in-chief. The battle fleet would never have set forth upon its epochal cruise

around the world if President Roosevelt had tolerated interference by Congress with his order for that cruise. But President Coolidge, in effect, solicits congressional interference with the discharge of what is exclusively his constitutional responsibility. It is so unlike his whole character as a public servant, so in conflict with his previous record that we cannot but hope that his mistake will not be repeated.

GEOLOGISTS START ALASKA OIL SURVEY.—New York *Herald*, 22 January, 1924.—In sending geologists and engineers of the Geological Survey to Arctic Alaska a midwinter start is being made in the examination of the Navy's largest petroleum reserve, according to the Department of the Interior. The area to be examined is somewhat larger than the State of Maine, covering some 35,000 square miles, but it is a practically uncharted wilderness that includes rugged mountain chains and vast silent stretches of tundra.

"Much of the region south of the reserve," states the department, "has already been surveyed by a Geological Survey party under Dr. Philip S. Smith, leader of the expedition just starting, and a part of the region east of the reserve has also been surveyed by J. B. Mertie, Jr., another geologist of this winter's expedition. In fact plans have been in contemplation since 1912 for the survey of this more northern region, but the work could not be undertaken earlier on account of lack of funds. It has long been known that this region might contain deposits of valuable minerals, but so many other areas afforded promise of more immediate results that this survey has been postponed from year to year.

"When the naval reserve was created by executive order last February plans were immediately formulated at the request of the Navy Department to undertake its geologic exploration. The first season's work resulted in the survey of more than 10,000 square miles, covering much of that part of the reserve that lies along the Arctic coast and extends from twenty-five to seventy-five miles inland; the southern and much of the inland part of the reserve is still unmapped. This year's expedition will enter the region from the south, starting during the winter, when some of the transportation problems are least difficult. The area will be approached by way of the ice free harbor of Seward, from which the Government railroad extends northward to Tanana River, one of the largest tributaries of the Yukon, a distance of over 400 miles. There most of the essential supplies can be obtained.

"The expedition must be entirely self-sustaining for about six months, requiring the freighting of supplies, mainly by dog sled, for 400 miles, even before the reserve is reached—supplies weighing between four and five tons, and including food, instruments, and even canoes.

"At Tanana dog teams will be purchased and packers, camp hands and dog team drivers will be employed. From Tanana the technical members of the party will go north with probably four dog teams, comprising some thirty dogs, and will be followed by slower going freight dog teams. From the town of Nenana, on Tanana River, the route to be followed lies along the well beaten trail that leads down the Tanana River to Tanana, at the junction of the Tanana with the Yukon, a distance of about 100 miles. From Tanana the expedition will follow the mail trail, used once or twice a month, which leads northward overland for a distance of 125 to 150 miles to Koyukuk River, another great tributary of the Yukon from the north, reaching the Koyukuk at the little mission of St. John's in the Wilderness, which stands almost exactly on the Arctic Circle. From here the route will follow up the Alatna River, a tributary of the Koyukuk, which rises in the high, rugged mountains that form the southern border of the naval reserve.

"At about 150 miles up the Alatna is the northern limit of timber, and here the party will establish a headquarters camp, from which it can explore the adjacent region for distances of fifty miles or more and search for a pass across the mountains while waiting for the slower moving freight dog teams to catch up."

CAPTAIN HERBERT SPARROW AND THREE SEAMEN ARE LOST.—*Army and Navy Journal.*—The U. S. light cruiser *Tacoma,* which went aground on a reef some sixteen miles from Vera Cruz, Mexico, on January 16, and whose bottom had been pierced in many places during the continued pounding she had received by heavy seas, is now said to be a complete loss and has broken up. Most of her officers and crew had been taken off just after she grounded, but Captain Herbert G. Sparrow, her commander, with several officers and a few men remained aboard to guard the ship and to render help if possible in salvaging her when the storm abated.

Captain Sparrow was killed on January 21 by wreckage while on the main deck, as were also the following men: Edward T. Herrick, radio man, second class; next of kin, mother, 94 Franklin Street, Framingham, Mass. Homer H. Lussier, radio man, first class; next of kin, mother, Mrs. R. D. Carleton, 74 Divinity Street, Bristol, Conn. Solomon Sivin, radio man, third class; next of kin, father, Isaac Sivin, 437 East 147th Street, New York City. The remainder of the crew aboard were rescued by the U. S. tugs *Allegheny* and *Bayspring.*

Late advices received by the Navy Department state that three additional officers and three enlisted men were injured in the wreck. The officers injured are Lieutenants T. B. Fitzgerald, I. W. Hungerford and Pay Clerk J. W. Nichols. The enlisted men are Chief Boatswain's Mate James F. McCarthy, Chief Radiomen James B. Cooper and H. Donath.

The *Tacoma* had a length over all of 308 feet six inches, a beam of forty-four feet, and a mean draft of fifteen feet nine inches. She was built by the Union Iron Works of San Francisco and was launched in 1903. She was first commissioned January 30, 1904. The contract price for hull and machinery was $1,041,900. Her main battery consisted of eight 5-inch guns.

NAVY'S CONSTRUCTION PROGRAM.—*Army and Navy Journal,* 9 February, 1924.—And the new construction program, as embraced in a bill (H.R. 6580) introduced by Chairman Butler, is a distinct disappointment to those who believe in the maintenance of a treaty Navy. The bill provides for major alterations in the *New York* and *Texas,* including protection against submarine attack, anti-aircraft deck protection, and a conversion of the ships to oil burners at a total cost of not exceeding $6,800,000. Eight cruisers to cost exclusive of armor and armament $11,100,000 each, and six river gunboats costing exclusive of armament $700,000 each are also authorized by the bill.

This looks very well on its face, but in submitting the bill the Navy Department quotes from the Director of the Budget the following:

"This proposed legislation has been presented to the President, who instructs me to advise you that it is not in conflict with the financial program, but that no supplemental estimates shall be submitted with exceptions for three river gunboats."

This means that about $2,000,000 will be asked for in the appropriations for the fiscal year of 1925 for construction under the program authorized by the bill. The eight cruisers, of course, constitute only a beginning in the program that will be necessary to bring the American Navy up to the treaty ratio. Still, under the program as submitted to Congress, even this is postponed for a year. There will be no assurance that the program for

the cruisers will be begun in the next session. New submarine authorizations asked originally by the Secretary are stricken from the budget recommendations.

MORE U. S. PATROL BOATS FOR YANGTSZE RIVER SERVICE.—*China Weekly Review*, 12 January, 1924.—The China Club of Southern California at a recent meeting adopted the following resolution urging upon the U. S. Congress the importance of constructing more river patrol boats to be used by the American Navy in the protection of American lives and property interests in China:

WHEREAS, It is clearly evident that we are now largely dependent upon both the British and Japanese gunboats for protection from raids by the Chinese bandits, a condition which is a disgrace and insult to the brave boys serving so faithfully in the American Navy, therefore be it

Resolved, That, we the members of the China Club of Southern California, urgently request the members of Congress to take immediate action to provide suitable vessels for our Asiatic Squadron for the patrol of the Upper Yangtsze River and any other river in the Orient where our nationals need protection.

In addition to this resolution, a number of other influential organizations including the Chamber of Commerce of the United States with headquarters in Washington have adopted similar resolutions.

MERCHANT MARINE

THE NAVAL RESERVE.—Felix Riesenberg, *Nautical Gazette*, 16 February, 1924.—American merchant service officers have passed through a number of periods of stagnation, feverish activity and uncertainty. Many of them have been out of employment, only the most fortunate have escaped the fate of the job hunter. All of this is part of the day's work to the seafaring man who is "on his own." The great majority of these officers were in some manner connected with the naval service during the war, and a great many of them are still carried on the rolls of the Navy in Class Six, otherwise known as the Volunteer Reserve.

Now it seems something more definite is to be done. Naval officers themselves have a high regard for the professional seaman. The making of a seagoing officer is a matter of years, and involves a great deal of experience afloat. The Navy, considered solely as a fighting force, an insurance against aggression, must first of all consider itself, and must bring the Congress to a state of mind wherein this consideration is provided for by adequate appropriation of funds. For some time the problems of partial disarmament have placed a burden of doubt and adjustment upon those charged with the security of our nation at sea. Now the problem of organizing and making available the seagoing personnel of the merchant marine is coming up for consideration.

The merchant service officer, unlike the naval officer, can hardly look upon the naval service as a means of livelihood. In fact, the merchant seaman must look to merchant shipping for his support, but he can and should look to a commission in the naval reserve as a valuable recognition of his worth, and a means toward the practical upbuilding of an established professional standing.

At the present time merchant service officers are without the benefits accruing through a continuous record of service, unless it be in the special service of some individual employer. No accumulative record of service is kept by any central authority. If a man shifts about he simply gathers a lot of discharges and in time may be looked upon as an unreliable citizen. On the other hand, a man who sees service on many runs, in all parts of the world, under varying conditions, should be gaining just the

sort of experience so many men lack. If an officer is being kept track of through proper naval reserve control, his chances for ultimate success would be greater, and his gradual promotion in rank would give him an anchor in the shifting sands of chance by which most merchant seaman are constantly surrounded.

On the other hand, a naval reserve will naturally carry with it a retainer of at least one month's pay of the rank of the reservist, and this might make a nest egg for a man if invested in insurance on the endowment plan. If the attitude of the merchant service officer is changing, and I believe it is, his association with the naval service will be a matter of growing benefit to himself and to the nation.

The owner, on the other hand, will have an added guarantee as to the character and purpose of officers seeking employment. Many questions of integrity and responsibility will be solved by an established and continuous naval reserve enrollment. The naval reservist becomes eligible to membership in the U. S. Naval Institute, giving him the benefit of a monthly review of naval and merchant service developments. His work with the U. S. Hydrographic Office has already made him familiar with this branch of the naval reserve, and his active participation as a reserve officer will open up a new avenue of interest. Many of the most valuable papers published in the PROCEEDINGS of the U. S. Naval Institute, dealing with merchant shipping problems, have come from the pens of reserve officers.

A reserve officer should also have the opportunity for service on vessels of the fleet; such service would stand out as a bright spot in the lives of men accustomed to an entirely different sort of seagoing. The engineer officer should be especially interested in this phase of co-operation between the Navy and the merchant service.

The whole scheme of a seagoing naval reserve seems to hinge upon a common-sense arrangement whereby the sea strength of the United States can be made available for instant use in time of emergency. When this is once accomplished all hands will feel better, and the merchant service officers will at last come into their own as a recognized part of our defensive strength.

Before winding up this matter it may be well to remind the officer contemplating naval reserve recognition that nothing worth while is gained without a corresponding amount of service rendered. Officers may consider it a bore to be examined at periodic intervals by naval doctors. Ashore a growing number of people pay good money for this kind of an examination, and as a man gets beyond forty the periodic overhaul becomes a necessary duty.

In time we may see every first-class American merchant craft flying a distinctive naval reserve flag, and a new order of pride and efficiency will advise the world that American ships and American sailors have come back to the traditions established by the famous clipper ships of the decade before the Civil War.

NEW YORK HARBOR.—*Nautical Gazette*, 26 January, 1924.—Some of the leading steamship men in New York have suggested a rearrangement of existing regulations and possibly the making of new rules governing harbor traffic in the port of New York, and the matter is now considered to be so necessary that it will be brought before the American Steamship Owners' Association, the New York Maritime Exchange, city authorities and the Federal Government. Declarations made by Captain Herbert Hartley of the *Leviathan*, following the grounding of his ship in the lower harbor that traffic rules were inadequate for the safety of big ships in particular were indorsed by Captain Sir Bertram Hayes of the White Star liner *Majestic*. It has been found, the steamship men say, that the views of these men are seconded by captains of other big liners and by many of the

pilots. The suggestion has been made that with but little variance from existing regulations the United States Coast Guard could be given authority to perform a valuable service. The congested condition at times, it is declared, calls for traffic regulations fully as strict as those which govern vehicle traffic on streets and highway. One proposal made is for the coast guard to establish patrol boats—especially on big sailing days or days when several big ships are scheduled to arrive. The keeping of light draft ships clear of the main or deep water channels, rules regulating places where crossings be made from side to side of the channel, and establishing of guide ships to clear a way for the big vessels when they back out into the stream may be suggested.

A CONSTITUTIONAL MONARCHY.—*Time*, 21 January, 1924.—The proposed separation of the Emergency Fleet Corporation and the Shipping Board (*Time*, January 14) was carried out, in modified form. Admiral Leigh C. Palmer was formally made president of the corporation, at a salary of $25,000 a year, with power to operate the Government's fleet and full authority over the personnel of the corporation.

This operation was carried out by a resolution of the board delegating its powers to the corporation. President Coolidge approved. Admiral Palmer approved, but made it plain that his approval was limited.

The reason that the Admiral was not satisfied was that the board had tied conditions to its gift. The salaries of the officials of the corporation must be approved by the board; the board reserves control over any litigation undertaken by the corporation; the power to fix routes remains with the board; sales of corporation property must be at prices and under conditions to which the board consents. The board, of course, retains its regulatory powers over shipping in general. Otherwise Admiral Palmer is to have a free hand.

Meanwhile, in the Senate, Walter Evans Edge of New Jersey introduced a bill for the abolition of the Shipping Board and providing that the direction of the Government's Merchant Marine be centralized in the control of one man.

Said Mr. Edge: "I want it to be clearly understood that it is in no wise a reflection on any of the individual members of the board . . . I have had some experience in business administration and I can see nothing but confusion when a purely executive function has seven heads with equal responsibility. . . . If there ever was a responsibility which required, in my judgment, one strong, powerful, executive head, it is the administration of the American Merchant Marine."

TO NAVIGATE THE SHIPPING BOARD.—*Boston Transcript*, 9 February, 1924.—The Shipping Board may now go full speed ahead, and, it is to be hoped, in the direction of the port of private ownership of the Government's merchant marine. President Coolidge this week designated T. V. O'Connor of Buffalo, to serve as chairman of the board, a post which has been vacant since the resignation of Edward P. Farley of Chicago. Mr. O'Connor for fourteen years was president of the International Longshoremen's Union. It is recalled of him as labor leader that in 1916 he was instrumental in blocking a general strike in New York that would have tied up the chief port of the country and stopped the shipment of war munitions destined for the countries soon to become our Allies in the great struggle. Mr. O'Connor served on the National Adjustment Commission during the war. He was subsequently named by Governor Miller to be a member of the New York State Industrial Commission, and in 1921 was appointed by President Harding to the Shipping Board, of which he now becomes the head.

Mr. O'Connor will have a New England man as first mate. The board

has chosen as vice-chairman, E. C. Plummer, who first learned to know ships and shipping when he was a young man in the Maine shipbuilding town of Bath. In later life, as a lawyer, he devoted himself to marine matters and for twenty-one years acted as attorney for the Atlantic Carriers' Association. Comparing his experience with that of Mr. O'Connor, it would seem that the two men who will be chiefly responsible for the conduct of the affairs of the board had received training that would enable the one to supplement effectively the efforts of the other.

The fact that the organization of the Shipping Board has been again perfected will cause general satisfaction. Without a chairman it was in somewhat the position of a ship without a captain, regardless of the efforts of the ship's company to keep the craft on her course. That was doubtless recognized by President Coolidge. He has named the skipper, and a first mate has been chosen. Navigation of the Shipping Board may be resumed under proper conditions. Even under the best of conditions it will be a case calling for navigation of the first order.

Shipping Board Wants Diesel Engines Installed.—*Power*, 22 January, 1924.—Legislation authorizing the United States Shipping Board to allocate $10,000,000 of its construction fund to a special fund to be used in installing internal-combustion engines and auxiliary apparatus in Shipping Board vessels and in lending money to private ship-owners for the same purpose will be recommended by the House committee on merchant marine and fisheries.

The money is to come from receipts from sales of vessels which, under the Jones act, are being placed in a special construction fund for five years. This fund now contains $75,000,000. The future of the seas, particularly as applies to cargo vessels on long routes, belongs to ships with Diesel type motive power, Admiral Benson told the committee. Because of its experience and its observation, the Board desires to equip fifty vessels with these engines and to encourage private owners to convert their ships likewise, he asserted.

Unless the American merchant marine is equipped with the Diesel type of motive power, it soon will be out-distanced by foreign competitors, the committee was told.

The Shipping Board introduced a statement showing that on a cargo ship of 8,500 deadweight tons, operation by the internal-combustion engines would save $9,960 a year as compared with a coal burner and $3,496 a year as compared with an oil burner in personnel alone.

A ship equipped with Diesel-type engines can go on a long route and return without refilling its fuel tanks, whereas either a coal burner or an oil burner would have to take on supplies before returning, the committee was told. Increased speed is one of the principal factors in favor of the conversion.

ENGINEERING

Bethlehem Oil Engine.—*The Nautical Gazette*, 26 January, 1924.—Rapid strides are being made in the development of large power marine oil engines, writes Joseph Hecking in the last bulletin of the American Bureau of Shipping. Among the latest arrivals is the Bethlehem engine which has gone through the regular stages of development and trial until the builders are now fully convinced that the engine has arrived at the commercial stage.

It may be remembered that the first experimental engine of this design was installed in the motorship *Cubore* after having been tried out continuously for over a year in the power plant of the Bethlehem Steel Corporation. The vessel has been in operation since 1921 and the experiments conducted with the engine aboard the vessel and the consequent

experience has led to a number of improvements which have been incorporated in the new engine, now operating in the Bethlehem Company's power plant.

In order to demonstrate the absolute reliability and the maneuvering ability of the engine a demonstration test was made on November 22 in the presence of representatives of maritime interests. The engine was run during tests through a range of revolutions from 35-116 r.p.m. For the information of those who are interested regarding lowest possible operating speed, it is worthy of note that the builders of the engine advise that it can be continuously and reliably operated at a speed as low as 25 r.p.m. all power cylinders burning fuel perfectly. A number of reversing tests were made showing that the engine can be reversed from full speed ahead to full speed astern in less than one minute, a considerable portion of which was spent in waiting for the engine to stop.

Little starting air was used in reversing, the engine picking up on fuel as quickly as the levers could be operated, in one to two revolutions. At no speed did the engine develop any appreciable vibrations, due partly to the substantial concrete foundation but principally because of the even turning efforts of the engine and its rigid construction.

The engine is a six-cylinder, two-cycle air injection oil engine with twenty-five and one-half-inch diameter cylinders and forty-eight-inch stroke, developing 2,950 b.h.p. at 116 r.p.m. The weight of the engine with attached air compressor and scavenging pumps is given as 280 pounds per b.h.p.; no flywheel being fitted. Each cylinder forms an independent unit, but they are arranged in blocks of two each in order to make room for coupling flanges in the crankshaft, allowing the latter to be made in three interchangeable sections. This arrangement also permits the assembly of four and eight cylinder units without material changes. The cylinders are fitted with water cooled liners, the lowest ends of which are provided with exhaust ports.

ITALIAN INVENTS EYE FOR SUBMARINE, BUT KEEPS PLAN A SECRET.—New York *World*, 25 January, 1924.—Rome, January 24.—Leandro Guglielmotti says he has invented an apparatus whereby the crew of submarines can see through water for a depth of 100 yards and horizontally for a radius of eighty yards. His invention consists of a small tower on top of submarines, equipped with an underwater periscope. A man inside the tower works the apparatus which throws light through the water and reveals the presence of mines, fenders and other contrivances to destroy submarines.

"If I ever get the funds to develop it, the invention will revolutionize submarine warfare," he said, adding that his apparatus could be attached to existing submarines.

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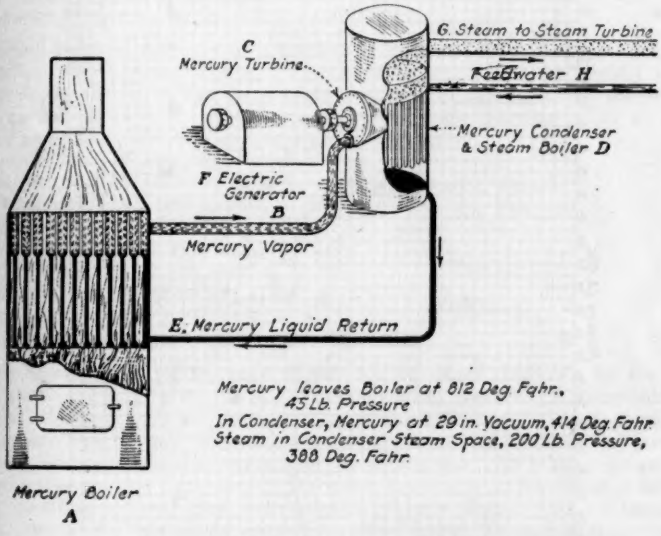
THE MERCURY-VAPOR BOILER AND TURBINE.—*Mechanical Engineering*, February, 1924.—The installation at Hartford of a mercury boiler and turbine marks the first step in a development of several years' duration to utilize commercially two fluids in a heat engine and thereby to increase the thermal economy. The Hartford Electric Light Company, a pioneer in adopting new power-plant equipment, was the first to employ a steam turbine in a central station in this country, and it is interesting to note that since the new prime mover has been installed at the Dutch Point Plant, much less trouble has been encountered in its operation than was experienced with the first steam turbine installed in the same plant in 1899. It must be realized, however, that the present mercury boiler is but a first step. Time alone determines the true value of an invention, and

that must undoubtedly be the case with the mercury-vapor power plant. Its principle is simple, but its successful utilization has already demanded the solution of scientific problems of a high order. Many technical and commercial obstacles must still be overcome. As the success of the steam engine depended upon the invention of a boring machine to produce accurate cylinders and as the automobile and the airplane demanded an advance in the internal-combustion engine, so the demand for greater economy in power-generation has compelled the study of the mercury turbine, and with its successful commercial development will come the solution of many related problems.

Great credit is due to W. L. R. Emmet, Mem. A.S.M.E., who has spent many years on this project for his courage and patience. The encouragement of the engineering profession goes with him as he carries the pioneer work forward.

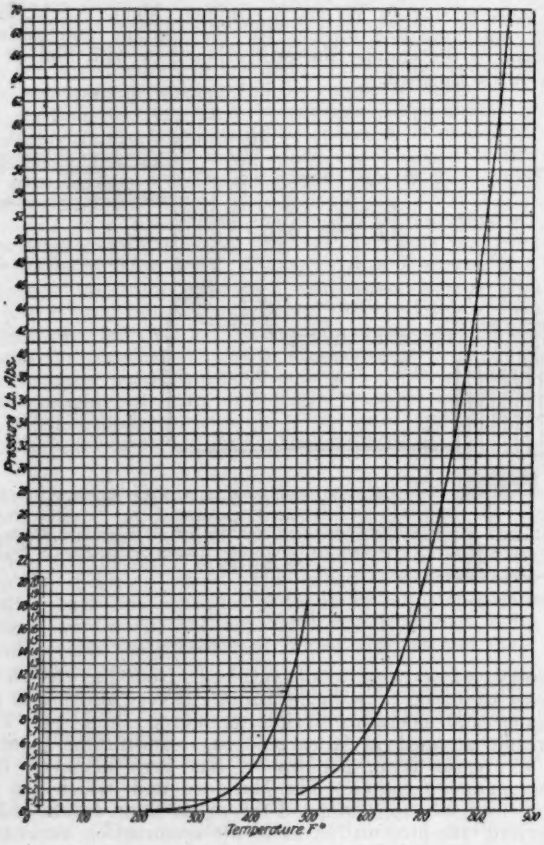

C
Mercury Turbine
G. Steam to Steam Turbine
Feedwater H
Mercury Condenser & Steam Boiler D
F Electric Generator
B
Mercury Vapor
E. Mercury Liquid Return
Mercury leaves Boiler at 812 Deg. Fahr., 45 Lb. Pressure
In Condenser, Mercury at 29 in. Vacuum, 414 Deg. Fahr.
Steam in Condenser Steam Space, 200 Lb. Pressure, 388 Deg. Fahr.
Mercury Boiler
A

The prospect of securing a kilowatt-hour from the electric generator at the expense of 10,000 B.t.u. in the furnace is very alluring to the power-plant designer and operator. Hitherto, 13,700 B.t.u. per kw-hr. has been the result attained in large modern steam-turbine plants and the equivalent of 14,030 B.t.u. per kw-hr. has been achieved in a large reciprocating pumping engine. The Hartford unit, which has not as yet borne its full load, has approximated the 10,000-B.t.u. result, and engineers are now waiting for information as to the construction, maintenance, and operation costs of units for central-station service.

The basic idea of this binary-vapor power plant is simple. Referring to Fig. 1, mercury is vaporized in a boiler *A* which it leaves at a temperature of, say 812° F., and a pressure of 45 lb. The vapor is then expanded in a turbine *C*, to a vacuum of 29 in. and then passes to a condenser *D* where it is liquefied with water as the cooling fluid. As mercury condenses at 414° F., the condensing water is converted into steam, so that in the steam space above the condenser there is a pressure of 200 lb. and a temperature of 388° F. From the condenser the liquid

mercury returns to the boiler through the pipe *E*, while the steam from the steam space of the condenser may either go direct or through a superheater to a steam turbine.

This simple basic idea can, of course, be elaborated by the addition of economizers, feedwater heaters, and superheaters. At the Hartford installation the boiler is oil fired and the flue gases after being used in the mercury boiler are drawn by an induced-draft fan through a mercury heater, a steam superheater, and a feedwater heater on their way to the stack.



The mercury is vaporized in a vertical cylindrical boiler of the fire-tube type with a single tube sheet, allowing one end of the tube to be free for expansion. The boiler holds about 30,000 lb. of mercury and is designed to evaporate 230,000 lb. of mercury per hour. When developing 1,900 kw. the unit will also deliver approximately 28,000 lb. of steam per hour at 200 lb. pressure and 100° superheat to the steam mains of the power station. The present type of boiler cannot be inspected or cleaned and another boiler of the mercury type is being designed.

The first description of the mercury-vapor boiler appeared in the January, 1914, issue of the *General Electric Review* in an article by Mr. Emmet entitled Power from Mercury Vapor, in which he explained that the broad principle involved in this process was suggested to him by Mr. Charles S. Bradley, who proposed and patented a process using certain substances, other than water, of high boiling points and relatively high vapor density. Consideration of the possibilities suggested by Mr. Bradley led Mr. Emmet to study the characteristics of mercury, and after a period of experimenting the plans of procedure were evolved. At the time of writing the article in question apparatus for about 100 hp. was nearly completed. The Hartford apparatus is the fifteenth of a series designed to reduce the amount of mercury used, to eliminate expansion strains, to permit free return of the mercury to the boiler, to obviate overheating, and to provide air- and mercury-tight joints.

In an article above referred to Mr. Emmet also enumerated the advantageous properties of mercury as follows:

Boiling point of mercury at atmospheric pressure, 677° F. (358° cent.).
Boiling point of mercury at 28 in. vacuum, 457° F. (236° cent.).
Vapor density is in the ratio of atomic weight and absolute temperature; as compared with water it is therefore 6.56 times as great at the boiling point and 6.8 times as great at 28 in. vacuum.
Specific heat of mercury liquid, 0.0373.
Specific heat of mercury gas (constant pressure), 0.0248.
(According to Kurbatoff; *Z. Phys. Chem.*, 43, 104, 1903.)
Latent Heat of Vaporization:
At 25 lb. abs. $r = 117$ B.t.u.
At 15 lb. abs. $r = 118$ B.t.u.
At 28 in. vacuum $r = 121$ B.t.u.
At 29 in. vacuum $r = 121.5$ B.t.u.
(Calculated from formulas by Kurbatoff.)

The boiling point of mercury at various pressures is shown by Fig. 2, and curves are also given in the article showing the energy theoretically available from mercury vapor within various pressure ranges.

Mercury has certain advantages as a thermodynamic fluid for power purposes, of which the following may be mentioned. Its boiling points at desired pressures are convenient. Its vapor density is so high that it gives a low spouting velocity and consequently a very simple type of turbine can be used; its volume at convenient condensing temperatures is such that it can be used for turbines without excessive exhaust passages. Thus the difficulty which today faces every steam-turbine designer employing high condenser vacuums, namely, efficient discharge of steam from the last stage, does not exist with mercury vapor.

In his paper on Margins of Possible Improvements in the Central Station Steam Plant, presented at the recent A.S.M.E. Annual Meeting, Ernest L. Robinson pointed out as the great advantage of the mercury turbine its utilization of a substance whose vapor pressure will not be excessive at the temperature to which the materials of construction may be submitted. Mr. Robinson also stated the theoretical increase of economy by use of the mercury turbine to be 28.7 per cent over good modern turbine practice with steam at 350 lb. per sq. in. pressure and 700° temperature, and utilizing the extraction cycle to the limit.

In the construction and operation of the mercury unit a property of the mercury was encountered that presented a troublesome problem. Mercury is a pervasive liquid that will with an almost human ingenuity search out every weak place in a structure and make its way through it, and the least porosity in a casting or the smallest crack in a welded

joint, which would be perfectly harmless in the case of water or steam at the same pressure, will be utilized as a means of escape. Leakage of mercury is especially undesirable, first, because of the general impression that mercury vapors are extremely poisonous, an impression the correctness of which is by no means certain; and secondly, on account of the high price of mercury. This means that every casting and every welded joint that comes in contact with the mercury must be 100 per cent leak-proof, and that only high grade materials and workmanship can be used. But this is expensive and only the future will show whether the price in terms of first cost, maintenance cost, and obsolescence and depreciation charges can be maintained within the limits which will permit competition with the standard types of prime movers for central stations. In this connection it should be noted that the Hartford unit is an example of unusual excellence in welding construction.

A second obstacle to the general adoption of the mercury boiler is the apparent shortage of mercury ores. According to a communication from the U. S. Bureau of Mines, mercury is neither abundant nor widespread in its occurrence. The large producers of mercury are, in the order of normal importance, Spain, Italy, Austria, and the United States, the largest of them all being Spain. The mercury market in Spain is absolutely controlled by the British. Italian production is also largely controlled by English interests, and while the control of the Austrian production is less certain, it is apparently drifting in the same direction. When this is completed English interests will control over three-quarters of the world's mercury.

The output in the United States before the war was normally slightly in excess of domestic demand, but due to the exhaustion of the richer and easily worked deposits, production is declining and it is expected that the future needs of this country will have to be met by importations from Europe. The visible resources of ore at Almaden, Spain, are estimated at 40,000 metric tons, and those in Austria-Hungary at about one-half that amount.

In 1921 the world's production was 71,339 flasks (one flask = 75 lb.), or 2,432 metric tons. The average cost of producing a flask of quicksilver in Europe is about $30. To this must be added the present duty of 25 cents per pound, or $18.75, and the ocean freight of $2 per flask, making a total of $50.75 as the minimum cost to the importer at the dock, which leaves no profit to the producer.

With these data at hand the following figures appearing in an editorial in the *Engineering and Mining Journal-Press* for December 22, 1923, become significant. This journal gives a tentative figure for the total amount of boiler horsepower used in the United States in the mining industries of 2,258,000 hp., which, on the basis of the requirements of the Hartford boiler, would call for nearly 34,000,000 lb. of quicksilver, or more than the total amount produced in the United States in the last twenty-one years. But the total amount of high-pressure steam-boiler capacity used for all purposes in the United States is 18,000,000 hp., and its equipment would require 270,000,000 lb. of mercury.

According to the same journal, the world's production of mercury in 1921 was only 4,451,000 lb. or enough to equip but 148 boilers of the size used at the Hartford plant. The total world's production for the fourteen years from 1908 through 1921 was 110,337,000 lb., or less than half what would require to change the high-pressure steam boilers of the United States alone to the mercury system.

The question arises whether increased demand would not result in an increased supply. Beyond any doubt such a demand would bring about increased production from present mines and perhaps the exploitation of

new mines containing low-grade ore; but this demand would have to be made in terms of higher prices for quicksilver.

Owing to the relatively small quantity of quicksilver produced, its price has been subject to wide fluctuations. For many years before the Great War the price was generally below $40 a flask. If the demand for quicksilver for boiler purposes grows, it is inevitable that a skyrocketing of prices will take place.

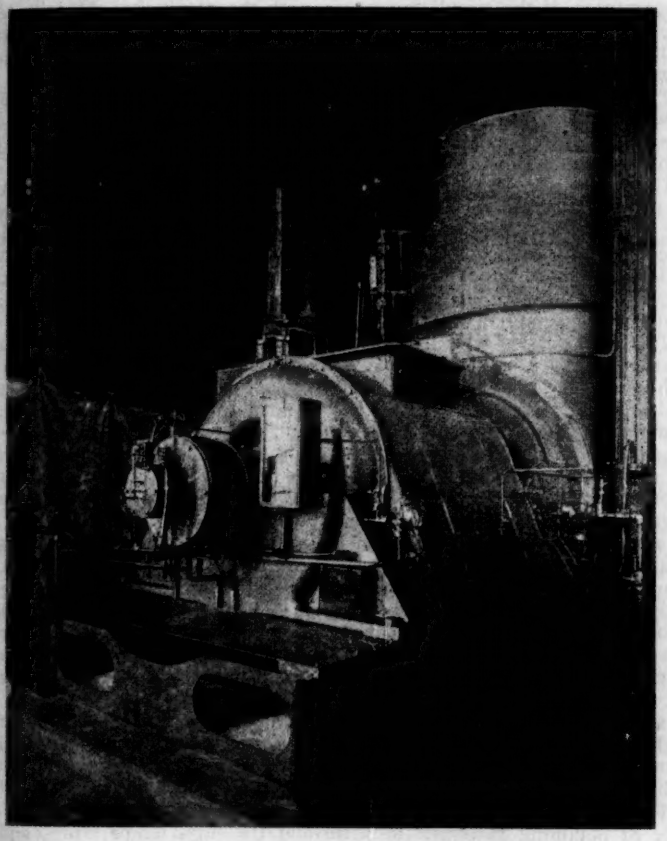


FIG. 3. MERCURY VAPOR PROCESS UNIT AT HARTFORD

In 1921 the United States, although producing only 6,339 flasks (475,425 lb.), still remained the third largest producing country in the world, Italy (including the Idria mine) ranking second, and Spain (with the Almaden mine) first.

The following views expressed in a discussion of mercury-vapor prime movers at the Institution of Mechanical Engineers in London last November and published in *The Engineer*,[1] may be of interest.

[1] *The Engineer*, vol. 136, no. 3543, Nov. 23, 1923, pp. 563-565, 6 figs.

W. J. Kearton of Liverpool University presented a paper entitled The Possibilities of Mercury as a Working Substance for Binary-Fluid Turbines. This paper was devoted almost wholly to the theoretical side of the subject. The author, grouping all the advantages and disadvantages attending the use of high-pressure steam, said that steam falls short of being an ideal working fluid because at the temperatures we desire to reach to improve the efficiency, the pressures are too high. At the other end its pressure is too low and its specific volume too great at the temperatures of the circulating water, with the result that difficulty arises in providing the necessary area for the flow of fluid in the last stages of a turbine. The mercury curve is not far below the ideal at high temperatures, and even at 400° F. its vapor pressure is exceedingly small. At 800° F. the vapor pressure of mercury is only just over forty-five pounds. It would therefore appear that mercury vapor is to be used in a low-pressure, high-temperature turbine combined with the use of steam in a high-pressure, low-temperature turbine.

On the whole Mr. Kearton came to the conclusion that although the efficiency of the mercury-vapor steam turbine is not quite as great as that of the Diesel or Still engine, the plant is mechanically ideal and can be constructed to develop relatively high powers with ease. He doubts if it will ever be adopted for the propulsion of merchant ships, because simplicity and reliability are factors of more importance in such a case than fuel consumption.

In the discussion which followed, I. V. Robinson attempted to estimate what saving per unit generated would accrue if a 10,000-kw. station, such as that at Blackburn, changed from an ordinary steam-turbine plant to the binary principle. Taking the no-load losses into consideration, he estimated that as a result of the improved efficiency the binary-fluid principle would save three-eighths of the steam-turbine fuel. Setting the saving thus represented against an estimated twenty per cent increase in other works' costs, and an increase in capital charges arising from the binary plant being an assumed twenty-five per cent more expensive than an ordinary steam-turbine equipment, he came to the conclusion that the binary principle would yield a net saving of 0.05d (about 0.1 cent) per kilowatt-hour generated. Should coal rise to twice its present price—an almost unthinkable proposition—the net saving would still only amount to 0.25d per kw-hr. (0.5 cent) even if no allowance were made for the fact that with coal doubled in cost the plant would be more expensive to purchase and install. The proposition could not be regarded as attractive, for no engineer could recommend such a wholesale change for the sake of saving one-twentieth of a penny per unit. In a concrete instance, it might be noted, a London station—that at Stepney—saved a net half-penny (1 cent) per kw-hr. by the installation of a new type of steam turbine.

Further in the discussion Mr. H. W. Patchell emphasized the difficulty of obtaining materials to withstand the high temperatures and the penetrating and amalgamating propensities of mercury. He also pointed out that if mercury vapor contained any trace of mercury moisture, the steel was cut just as if it had been subjected to a sand blast. The need for welding is not a valid objection as welded joints can readily be broken at any time by means of an acetylene jet.

An editorial in the *Practical Engineer*[2] in discussing this subject points out as one of the possible disadvantages the fact that the latent heat of mercury is only about 129 B.t.u. at a temperature of 410° as compared with the latent heat of steam at the same temperature of 830 B.t.u., so

[2] *Practical Engineer*, vol. 68, no. 1918, Nov. 29, 1923, p. 296.

that at least six and one-half pounds of mercury would be needed to provide the latent heat for one pound of steam, and actually over nine pounds would be needed because, owing to the wetness of the mercury vapor after expansion, the figures have to be divided by 0.7.

The mercury-vapor boiler represents an incursion into an entirely unknown region. It is not unusual for an important development ultimately to take a path entirely different from the one which was mapped out for it by its original creators. Hadfield's manganese steel proved to be valueless as a tool material, but found extensive applications for a number of other useful purposes. The original Mannesmann process was devised to make seamless tubing, but did not prove either economical or satisfactory for this purpose. It has, however, developed into an extremely useful process for piercing billets which are afterward drawn into tubes on the conventional benches. It would not be surprising, therefore, as our knowledge of the binary-vapor power plant develops, if some useful field of application for it outside of the central station were found where its peculiar properties might offer important advantages.

There are several developments in prime movers which have reached a stage where they may properly be compared with the mercury-vapor boiler. The thermal efficiency of the Diesel engine is well-known, but hitherto it has not been seriously considered for central-station work because large units have not been constructed. Lately, however, the German M.A.N. works is said to have completed a unit developing nearly 17,000 hp. in six cylinders. If this development should prove successful it may become an important factor in central-station design. Another type of engine, the Still-Scott, promises higher thermal efficiency than the Diesel. In this engine the cooling water is vaporized to steam partly by the direct action of combustion in the cylinder and partly by heat from the exhaust gases, which later also preheat the feedwater. A small auxiliary oil burner is employed. Recently published tests indicated that this device may produce a kilowatt-hour for about 8,500 B.t.u.

In the central station today the important requisite for prime movers is reliability, and recently this has been stressed as more desirable than high thermal economy as it tends to a lower overall plant economy. It will be apparent, therefore, that all of these devices must pass through a period of severe trial before competing successfully with the present form of central-station prime mover.

AERONAUTICS

CALENDAR OF AERONAUTICAL EVENTS.

March 7-8—Curtiss Marine Flying Trophy Race and Flying Meet, Miami, Fla.

March 31—Closing date for papers submitted to Royal Aeronautical Society of Great Britain for the *R38* Memorial Prize.

April 23—National Balloon Race, San Antonio, Tex.

April—Start of the World Flight of U. S. Army Air Service.

Start of U. S. Naval Arctic Air Expedition.

June 3-11—International Aircraft Exposition, Prague, Czechoslovakia.

June 15—Gordon Bennett International Balloon Race, Brussels, Belgium.

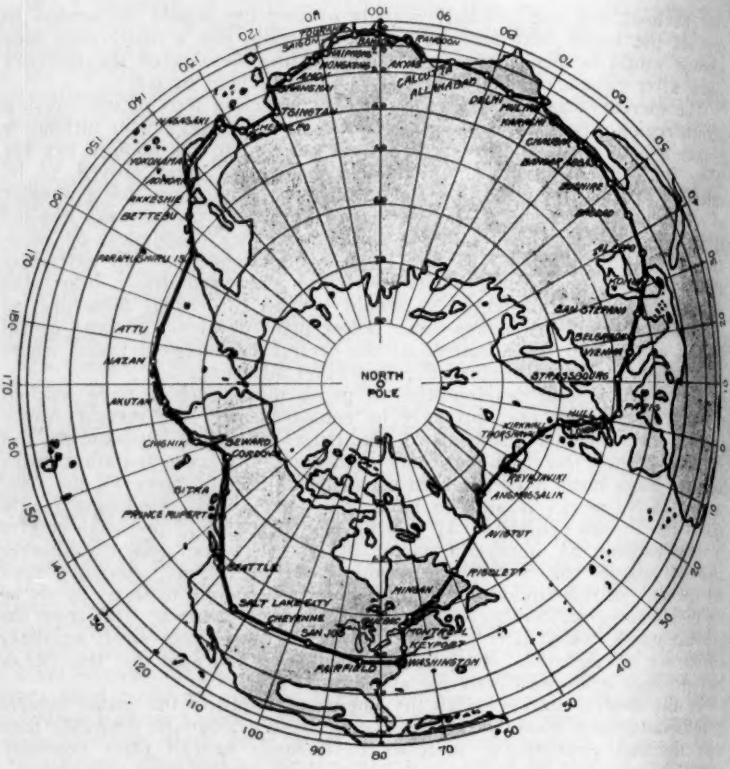
June 22—Commodore Beaumont International Cup Race for high speed airplanes, Istres, France.

July 5-6—Zenith International Efficiency Contest, Paris, France.

August—*Tour de France des Avionnettes.* International Round-France race for light airplanes.

October 2-4—International Air Races, including Pulitzer Trophy Race, Dayton, Ohio.

December 17—Twenty-first anniversary of the first successful airplane flight.



Official Drawing U. S. Army Air Service

ITINERARY OF ARMY PILOTS FOR ROUND-THE-WORLD TRIP THIS SPRING

COOLIDGE STOPS POLE-TRIP PLAN OF "SHENANDOAH."—Baltimore *Sun*, 16 February, 1924—Washington, February 15.—President Coolidge ordered today that preparations for the naval North Pole expedition be suspended.

By direction of the President, Secretary Denby sent out orders bringing all preparations for the flight of the *Shenandoah* to an abrupt stop pending some form of congressional approval of the project.

A White House spokesman intimated that if such approval was forthcoming preparations would be resumed immediately. Naval officials were frankly doubtful, however, that they could obtain congressional sanction in time to carry out the flight this year.

The decision of the President was announced in the following statement issued by Secretary Denby:

"Orders to cease preparations for the Polar expedition were issued today by the Secretary of the Navy. The President, having been informed that considerable opposition existed to the required expenditure of $350,000, instructed the department not to proceed with the expedition at this time nor until the naval bills have been considered and Congress given an opportunity, if it desires, to express its views upon the polar expedition."

At the White House it was said the President, in view of opposition to the flight that had arisen in Congress believed it wise to await action by that body to show its approval of the expenditures necessary to carry out the plans.

The White House explanation suggested that a request had been submitted for authority to spend $400,000 on the polar expedition. The pending naval bill, now in the House, contains no item of this character, nor was it clear to what specific authorization the White House spokesman had reference.

The naval bill to cover expenditures for the fiscal year 1925 was voted out by committee, with a report attached saying that the committee had discussed the polar flight plan with Secretary Denby and naval officers, but would not interfere with it in any way in the supply measure, since expenditures for the flight were to be made from funds already available and not from those provided in the 1925 supply bill.

There have been instances of opposition to the flight being voiced in the Senate and House, but no definite movement has been apparent in either chamber. Representative Longworth, of Ohio, Republican leader in the House, said today he had heard of no such movement.

Chairman Madden, of the House Appropriations Committee, is understood to be in favor of the flight, but opposed to any congressional action in connection with it. He said today he took the position that operation of the naval air forces was as much a matter of departmental discretion as operation of the surface ships and that Congress should not interfere.

Chairman French, Republican, Idaho, who heads the naval subcommittee of the Appropriations Committee, was inclined at first to doubt the wisdom of the attempt to reach the Pole by air. A resolution by Representative Taylor, Democrat, West Virginia, calling on Secretary Denby for information on the project, resulted in the committee taking it up with naval officials.

After hearing Mr. Denby, Rear-Admiral Moffett, chief of the naval air service, and Commander Bartlett, Arctic explorer and reserve officer, called to active service to participate in the flight, the committee dropped this inquiry. Representative French said today the naval officials had made out a good case for their plans.

Representative Byrnes, Democrat, of South Carolina, of the Naval Committee, said today he knew an amendment to the naval bill would be offered in the House making funds provided for 1925 unavailable for the purpose of the polar trip. Representative Rogers, Republican, Massachusetts, however, has pending a resolution which would put the House on record as favoring the flight. He said tonight he would attempt to bring his resolution up tomorrow for action.

The $350,000 cost estimate given in Secretary Denby's statement covers all expenditures, navy officers believe, necessary for the trip. The chief items are refitting the colliers *Ramapo* and *Patoka* to act as floating bases for the airship. They were to have been equipped with mooring masts and fitted to carry seaplanes as auxiliary craft for making observations preparatory to the flight. The *Ramapo* is at the Mare Island yard awaiting conversion for the polar trip. She was scheduled to be sent to the Nome (Alaska) jump-off base for the polar expedition. The plan was to make the ship a supplementary base to the shore establishment at Nome, where a shore mooring mast was to be erected.

The *Patoka* is due soon at Norfolk for similar conversion. She was to have been sent to Spitzbergen as a stand-by base for the airship in case contrary winds prevented return to Nome direct, after the flight to the pole. In the event of headwinds the airship would have gone to Spitzbergen to await better opportunity for the Nome trip.

The *Patoka* is scheduled to be fitted with a mooring mast, in any case, for use as a floating base and tender for the *Shenandoah* when the airship is tested next year in operations at sea with the fleet. The time of the collier's conversion was advanced to permit her use during the polar flight. The *Ramapo* was being fitted out only because of the Arctic trip.

Fear lest today's postponement means the trip must be abandoned for this year is based on the fact that the plans had been worked out on a careful schedule in which every day counted. Unless necessary preliminary work can be done at Nome before the ice goes out, opening the water route to that place, it is said by officers, equipment of the Nome shore base and the vitally necessary aerological survey work cannot be accomplished in time to permit the attempt during the brief summer season, which affords the best chanee of success.

The advance party was at Bremerton Navy Yard, Washington State, today, expecting to leave for Alaska tomorrow for the sled trip to Nome. Unless it gets started before the snow crust breaks up the party only can await the clearing up of the ice to make the journey by boat.

The Navy Department is as yet undecided whether to proceed with the conversion of the *Patoka* for use as a fleet tender for the big airship or to defer that work until next year. Repair of the *Shenandoah* and refitting her for active service will proceed without interruption, it was said. The officer personnel of the dirigible recently was changed in a general shake-up preparatory to the North Pole expedition. A new program of test flights will be mapped out to replace the polar project this summer.

WORK OF RECONDITIONING "SHENANDOAH" TO CONTINUE.—Lakehurst, N. J., February 15.—President Coolidge's order suspending preparations for the polar flight of the *Shenandoah* will not interfere with the reconditioning of the dirigible, which was battered on her runaway trip January 26, it was announced at the naval air station here tonight. The orders simply will apply to the large amount of equipment which is being assembled expressly for the North Pole flight.

Work of repairing the *Shenandoah* is progressing favorably, Commander McCrary said today. The ship, it is expected, will be returned to service about May 1.

Lieutenant Commander Zachary Lansdowne arrived at the station today and reported to Commander Frank R. McCrary. He will take command of the ship tomorrow morning. Commander McCrary, who will be succeeded in command of the station by Commander Jacob Klein, Jr., will leave next week for Mare Island, Cal., to assume command of the *Canopus*, a submarine tender.

ORDNANCE

A NEW MAN-STOPPER.—*Naval and Military Record.*—I have War Office authority, writes a correspondent, for contradicting the published statements that the Lewis gun, which was such a deadly man-stopper in the late war, is to be scrapped in order to give place to the Browning gun, which is an American invention. No one disputes that the automatic Browning is a very effective rifle, but before it can displace one of the most serviceable weapons ever supplied to the British Army it will have to answer a good many tests.

The fact is the army authorities are now, as always, experimenting with new guns, and the Browning is one of them, but to assert that any decision has been arrived at is, to say the least, premature. There is a big gulf between the usual technical tests and experiments and the re-arming of the British troops.

The Browning undoubtedly has its good points. It weighs only fifteen pounds, and can be fired from hip or shoulder. It somewhat resembles the

Lee-Enfield service rifle, and is very simple in construction. The magazine contains forty cartridges, which can be fired in two and one-half seconds. The empty magazine is detachable, and is easily replaced by a new one. The rifle is air-cooled, and has no perceptible "kick."

NAVIGATION AND RADIO

NEW TYPE RADIO BEACON WILL GUIDE NAVIGATORS.—WILL BE OF ESPECIAL VALUE IN AVIATION—EVEN IS APPLICABLE TO MOTOR BOATS.—Boston *Transcript*, 16 February, 1924.—Washington, February 16.—A new, directive type of radio beacon which will be of great use to navigators of the air or water has been perfected by the United States Bureau of Standards in co-operation with the Signal Corps and Air Service of the Army. The beacon consists of two coil antennæ so placed as to cross each other at an angle of 135 degrees. The transmitting set is automatically connected first to one and then to the other, one letter of the signal being sent over each. The intensity of the signal from an antenna of this type varies from a maximum in the plane of the coil to almost zero at right angles. A receiving-set located along the line bisecting the angle between the coils will therefore receive signals of equal intensity from both.

A ship or airplane receiving the signals will be able, by first proceeding to the point where the two signals are of equal intensity to steer directly for or away from the beacon without regard to conditions of visibility. The signals may be received by the most ordinary receiving-set and may thus be of value to motor boats and small craft generally.

The invention will be of the greatest value in aviation. Its efficiency was recently proved when an airplane flew from Dayton to a point 100 miles away, with the pilot depending for guidance entirely upon signals received from one of these beacons by means of an ordinary airplane receiving-set.

It will also be used in the navigation of rivers and crooked channels to supplement the range lights now employed. Beacons can be placed at the range light locations and navigators will be able to follow a straight course on the foggiest nights. It has already been tested successfully along the Potomac River and Chesapeake Bay by the Lighthouse Service, and may be used on the Mississippi River. Lighthouse stations along the coasts may be equipped with the new device, but it cannot be used on lightships since they are continually shifting their directions with wind and tide.

NAVAL WIRELESS REGULATIONS.—*The Engineer*, 1 February, 1924.—New regulations governing the use of wireless telegraph or telephone apparatus by foreign warships in British harbors have been issued. Among other things, these regulations state that foreign war vessels lying in a naval port or in any harbor which is close to a naval port, must obtain permission from the senior naval officer at the naval port to use their apparatus. The system of transmission, wave lengths and the times at which it is proposed to send out messages must also be specified. Foreign warships lying in any harbor which is not close to a naval port must conform to certain regulations. Transmissions on a wave length of 600 m. are forbidden, except for the purpose of making or answering signals of distress. Interference with naval, army or air force signalling must be avoided, and transmissions must be discontinued at the request of any naval authority, the port authorities or any fixed shore station.

MISCELLANEOUS

PRESIDENT COOLIDGE HONORS FORMER PRESIDENT WILSON.—BY THE PRESIDENT OF THE UNITED STATES OF AMERICA

A PROCLAMATION

TO THE PEOPLE OF THE UNITED STATES: The death of Woodrow Wilson, President of the United States from March 4, 1913, to March 4, 1921, which occurred at 11:15 o'clock today at his home at Washington, District of Columbia, deprives the country of a most distinguished citizen, and is an event which causes universal and genuine sorrow. To many of us it brings the sense of a profound personal bereavement.

His early profession as a lawyer was abandoned to enter academic life. In this chosen field he attained the highest rank as an educator, and has left his impress upon the intellectual thought of the country. From the presidency of Princeton University he was called by his fellow citizens to be the chief executive of the State of New Jersey. The duties of this high office he so conducted as to win the confidence of the people of the United States, who twice elected him to the chief magistracy of the Republic. As President of the United States he was moved by an earnest desire to promote the best interests of the country as he conceived them. His acts were prompted by high motives, and his sincerity of purpose cannot be questioned. He led the nation through the terrific struggle of the World War with a lofty idealism which never failed him. He gave utterance to the aspiration of humanity with an eloquence which held the attention of all the earth and made America a new and enlarged influence in the destiny of mankind.

In testimony of the respect in which his memory is held by the Government and the people of the United States, I do hereby direct that the flags of the White House and of the several departmental buildings be displayed at half-mast for a period of thirty days, and that suitable military and naval honors under orders of the Secretary of War and of the Secretary of the Navy may be rendered on the day of the funeral.

Done at the city of Washington, this third day of February, in the year of our Lord one thousand nine hundred and twenty-four, and of the independence of the United States of America the one hundred and forty-eighth.

CALVIN COOLIDGE.

By the President.
CHARLES EVANS HUGHES,
Secretary of State.

RECOGNIZING GREECE.—Boston *Transcript*, 30 January, 1924.—Re-establishment of official relations between the United States Government and the Government of Greece, announced by the Department of State in a statement made public today, is a move that has been made possible by the recent course of events in Greece. Recognition had been withheld up to this time because this Government was not entirely satisfied with the way that the previous governments had come into power, nor with the way that they had fulfilled the obligations that devolved upon them. The elections of December 16, however, seem to have established a reasonably stable administration at Athens, and the return of Eleutherios Venizelos has added to the general confidence in its strength and permanence. The Athens Government has already been recognized by Great Britain, and it may be expected soon to take its place in the European family. Formal appointment of an American minister must await the plebiscite soon to be held in Greece, to determine whether that country is to be a monarchy or a republic.

The action of the Department of State does not mean, however, that we have taken sides on any matter of Greek domestic politics. It does not mean that we are backing the Venizelists against the Constantinists. It merely means that we have entered into official relations with the Government that is in apparent control of the situation, and that represents, so far as we can judge, the will of the Greek people. Nor can the recognition be interpreted as a rebuke to Italy for the Italian ultimatum to Greece, at the time of the murders of the boundary commissioners, which was followed by the seizure and the shelling of Corfu. It is not the habit of this country to rebuke one Government by according recognition to another.

THE LEAGUE.—FOUR YEARS OLD.—*Time*, 21 January, 1924.—The League of Nations celebrated its fourth birthday. On January 10, 1920, the foundation of the League was laid; for on that date the Covenant of the League, which was included in all the main peace treaties with the enemy States, came into force concurrently with the Treaty of Versailles. During the following eleven months the super-structure of the League was built and in December, 1920, the first Assembly of the League of Nations met in Geneva, the permanent headquarters of the organization.

A rough outline of the League's membership, success, failures, tells its own story:

MEMBERSHIP: 1920, when the League formally came into being: Argentina, Australia, Belgium, Bolivia, Brazil, Canada, Chile, Czecho-Slovakia, France, Great Britain, Guatemala, India, Italy, Japan, New Zealand, Panama, Paraguay, Persia, Peru, Poland, Siam, South Africa, Spain, Uruguay; February 10, 1920: the Serb-Croat-Slovene State (Yugo-Slavia); February 16, Colombia; March 3, Venezuela; March 5, Norway; March 8, Cuba, Denmark, Switzerland; March 9, Holland, Sweden; March 10, San Salvador; March 30, Greece; April 8, Portugal; June 30, Haiti, Liberia; July 16, China; September 10, Rumania; November 3, Honduras, Nicaragua; December 16, Albania, Austria, Bulgaria, Costa Rica, Finland, Luxembourg; September 22, 1921, Esthonia, Latvia, Lithuania; September 18, 1922, Hungary; September, 1923, Abyssinia, Irish Free State. Total: fifty-four nations.

NON-MEMBERS: The principal countries are: Afghanistan, the new Arabian States, Ecuador, Egypt, Germany, Mexico, Russia, Turkey, United States of America.

SUCCESSES: Settlement of the Swedish-Finnish dispute over the Aaland Island; settlement of the Germano-Polish dispute over the delimitation of Upper Silesia; settlement of the Yugo-Slavian-Albanian fracas, which threatened to bring on a new Balkan War; financial administration of Austria, which has gone a long way toward putting that country on its feet. Many legal matters have been settled by the League and many are under consideration. Special Commissions have been formed to deal with international questions of health, drug traffic, economics, finance, communications, armaments, White Slave traffic, labor, customs, relief of refugees, etc. The activities of the League in this direction have been as innumerable as they have been beneficent. Moreover, more than 500 treaties have been filed with the League. The significance of this is that it tends to extirpate the evils of secret diplomacy by destroying its means.

DOUBTFUL SUCCESSES: Under this heading come a number of cases where League settlement was unsatisfactory, but opposed by the fact that threatened war was undoubtedly avoided by League action: Vilna dispute between Lithuania and Poland, not yet definitely settled; Corfu incident between Italy and Greece, settled by Council of Ambassadors and World Court after recommendations were made by the League.

FAILURES: There have been no absolute failures. Cases, such as a dispute between Hungary and Rumania, were brought before the League by one party but were not agreed to by the other (Rumania). This is only an indirect failure which was caused not by any action of the League but by the recalcitrant party or by the Convenant, depending upon the point of view. There are, however, other matters under the care of the League, upon which the League has taken action, such as mandates, etc., the worth of which can be decided only after a period of time has elapsed.

WORLD COURT: The Permanent Court of International Justice (World Court) may be said to have been born in 1923, although the idea was projected as early as 1920. On the juridicial side, the Court is utterly divorced from the League; on the administrative side, it is largely a department of the League.

SETTLEMENTS: Kiel Canal Case. *Allies vs. Germany*—Allies won; Upper Silesian case, *Germany vs. Poland*—opinion asked by League, Court decision favored Germany; Teschen dispute, *Czecho-Slovakia vs. Poland*—advisory opinion asked by League, decision favorable to Czecho-Slovakia. The International Commission of Jurists of the World Court drew up rules to govern warfare.

FAILURE: Eastern Karelian case, *Finland vs. Russia.* Russia refused to recognize the Court; the Court declared its incompetence to deal with the case.

CURRENT SHIPBUILDING PROGRAMS: MANY NEW CRUISERS AND SUBMARINES: JAPANESE NAVAL FINANCE: DOCKYARD RECONSTRUCTION.—By Hector C. Bywater, *Naval and Military Record*, 16 January, 1924.—In view of the fact that the Government, had it retained its majority, would have introduced a new program of warship construction in the present session, and that questions of sea defense are certain to come under discussion in Parliament between now and the presentation of the Navy Estimates for 1924-25, a summary of current developments abroad may be useful for purposes of comparison.

UNITED STATES: At the end of 1923 the following ships were building for the United States Navy: Two aircraft carriers, of 35,000 tons each; four light cruisers, 7,500 tons each; twelve submarines, from 900-2,025 tons; one gunboat; four auxiliary ships of 10,600 tons each. Besides these there were twelve destroyers and seven submarines authorized for construction but not yet contracted for. In the Naval Supply Bill now before Congress provision is made for laying down the following new vessels: eight cruisers of 10,000 tons, six gunboats for Asiatic service, and three cruiser-submarines of 3,000 tons. It is not known at the time of writing whether this program has been approved.

JAPAN: At the same date Japan was at work on six light cruisers, of 5,570-7,500 tons; eleven destroyers, 900-1,400 tons; thirteen submarines, 800-1,500 tons; two aircraft carriers, of 26,000 tons; and a number of special service ships. Preparations have been made for laying down in 1924-25 the following vessels: four cruisers of 10,000 tons, two cruisers of 7,500 tons, eighteen destroyers of 1,500 tons, and sixteen submarines of 1,500-2,000 tons.

FRANCE: This year will witness the completion of the first units built under the initial section of the French post-war program, which embraces one aircraft carrier of 21,450 tons, three light cruisers of 7,875 tons, eighteen destroyers of 1,400-2,400 tons, and twelve submarines of 680-1,100 tons. Work will probably begin during the year on the second half of the program, which is of much wider scope and includes the following ships: six cruisers of 10,000 tons, thirty-nine destroyers of 1,450-2,400 tons, four submersible cruisers of 3,000 tons, thirty submarines of 1,300

tons. In all, therefore, France is now building or has authorized a veritable fleet of fighting ships, made up of one aircraft carrier, nine light cruisers, fifty-seven destroyers, and forty-six submarines.

ITALY: A new program has been adopted for completion by 1927. It consists of five light cruisers of 9,500-10,000 tons, twenty destroyers, and twenty submarines. Approximately one-fifth of this tonnage will be put in hand during the current fiscal year.

Adding together the ships enumerated above we find the four principal foreign naval Powers to contemplate or have actually under construction the following new men-of-war: cruisers, thirty-eight; destroyers, 118; submarines, 117.

In consequence of the outrage against the Crown Prince Hirohito in December the Japanese Government resigned, and a new Cabinet has been formed by Viscount Kiyoura. The Navy portfolio, held by Admiral Takarabe in the late Yamamoto Cabinet, has been transferred to Admiral Murakami Kakuichi. The new Naval Minister was born in 1861, and entered the service at a very early age. Previous to his promotion to flag rank in 1907 he served for a number of years as adjutant to the Naval Minister. Becoming a Vice-Admiral in 1912, he was appointed to the command of the Kure naval station. Two years later he was placed on half-pay as a result of the public commotion caused by certain disclosures relating to naval construction. He was, however, soon restored to active duty, serving first as Chief of the Naval Technical Bureau and later on as Admiral commanding the Third Fleet. The Cabinet changes are not likely to produce any appreciable reaction on naval policy. The late Minister, Admiral Takarabe, stoutly opposed the suggested reductions in the shipbuilding scheme when the departmental budgets were revised in November in order to meet the heavy charge of repairing the earthquake havoc. He was so far successful that the program remains unmodified, except that it is to terminate in 1928 instead of twelve months earlier.

The report in a New York paper that the Japanese Admiralty has just awarded contracts for submarine-cruisers of 3,000-4,500 tons displacement is not inherently improbable. It has been known for some time that the Imperial naval authorities were interesting themselves in submarines of the largest dimensions, and there is reason to believe that their representatives have been in touch with prominent designers in Europe for several years past. In August, 1921, the *Mainichi* stated that Mr. Makino Ritsu, a former official of the Yawata Ironworks, who had been visiting the industrial establishments of Germany, had purchased in that country plans relating to "secret naval construction." An earlier attempt to acquire these plans had failed, but on being instructed by Mr. Matsukata, chairman of the Kawasaki shipyard, to get possession of them at any price, Mr. Makino made a further effort, which proved successful. According to the *Mainichi*, Mr. Makino declared the plans to be of such importance that they would effect a revolutionary change in Japanese ship construction. To what type of vessel they referred was not stated, nor has anything more been published about the matter in the Japanese Press. The designs thus acquired may conceivably have been for large submarines, in which case Professor Flamm might be able to throw some light on the reported transaction.

The Japanese Navy Estimates for the coming financial year have been published. Those for the current year originally amounted to 278,000,000 yen, of which 125,000,000 was ordinary and 153,000,000 extraordinary expenditure. By extending the duration of the shipbuilding program, as noted above, and by various other economies, the budget for the present year has been reduced to 238,900,000 yen. a saving of nearly forty millions. The Estimates for 1924-25 provide for an ordinary expenditure of

126,300,000 yen and an extraordinary expenditure of 112,200,000, the total amount being 238,500,000 yen.

A sum of no less than 80,000,000 yen has been allotted for the reconstruction of the devastated naval base at Yokosuka, and a further twenty millions will be spent on making good the damage to ships, oil tanks, and establishments. Admiral Takarabe, the retiring Naval Minister, said in an interview in November that as many of the buildings wrecked at Yokosuka had long been obsolete and inadequate for naval requirements, they would be replaced by up-to-date edifices. In fact, the whole dockyard would be reconditioned on thoroughly modern lines. In the official account of the damage sustained at Yokosuka no mention was made of the docks and building slips, but the Reuter message published in *The Naval and Military Record* of January 2 contained some welcome information on this point. The largest building slip subsided two feet, with the natural consequence that the battle cruiser *Amagi*, which occupied the slip, had her keel so badly buckled that there was nothing for it but to scrap her entirely. She is to be replaced as an aircraft-carrier by the battleship *Kaga*, which appears to have had a narrow escape, as the graving dock in which she had been placed shortly before the earthquake suffered some damage.

In all there were six building slips at Yokosuka, three being of Dreadnaught dimensions, and five dry docks, ranging in length from 265 ft. to 747 ft. The Reuter message reports slight damage to the largest dock, but says that all the others escaped injury. What happened to the smaller building slips we are not told, but the havoc in the dockyard as a whole must have been very widespread, and may cost more to repair than the 80,000,000 yen earmarked for that purpose. Nothing has come of the suggestion, put forward by several newspapers soon after the earthquake, that Yokosuka should be abandoned as a major fleet base, seeing that the dockyards at Kure and Sasebo had ample resources for the maintenance of the small battle-fleet which the limitation treaty had left to Japan. Writing in the *Jiji*, a naval officer says that dockyards are just as important a factor as ships in the scheme of naval defense, and that Japan, in the event of war, would benefit far more from the possession of a well-equipped base at Yokosuka than by the additional ships which could be built with the money that is to be spent on repairing that yard.

EUROPEAN FLEET DEVELOPMENTS SINCE THE WAR: FATE OF RUSSIAN BATTLE CRUISERS.—By Hector C. Bywater, *Naval and Military Record*, 30 January, 1924.—The following survey of Europe's naval armaments in the post-war period is taken from *Der Triumph des Militarismus*, by Herr Kurt Hesse, a volume which has aroused considerable interest in Germany on account of its detailed and accurate presentation of the military and naval policies adopted by the various Powers since the peace.

FRANCE: Following the loss of the battleship *France* *The Moniteur de la Flotte* published on October 21, 1922, an article in which the naval power of France was declared to be in serious jeopardy. Since 1914, it pointed out, no important unit had been added to the fleet. The ships of the *Normandie* class had not been completed, and were in any case obsolete. Then came the Washington agreement with its serious restrictions, which made it necessary to overhaul the Navy Law and introduce a new program. This covers a period of twenty years, and provides for 175,000 tons of battleships, 330,000 tons of lighter surface craft, and 65,000 tons of submarines. So far, therefore, from having disarmed at sea, France is now engaged in augmenting her naval forces. When the Senate passed the navy credits in March, 1922, M. de Kerguezec, President of the Naval Committee, declared that "France must not abandon her destinies to anybody, not even to her dearest allies."

ENGLAND: In accordance with the Washington Treaty, twenty battleships have been withdrawn from the navy, the peace complements of capital ships in the Atlantic fleet reduced by fifteen and seven-tenths per cent, 10,000 men discharged from the dockyards, and two naval stations (Coast of Scotland and Western Approaches) abolished. Further, the personnel of the navy has been reduced by 20,000 officers and men, and is now down to 98,500. That England, after having for centuries refused to yield her supreme position afloat, has at last accepted the one-Power standard is now a manifest fact. Although two new battleships are on the stocks, it is clear that in her case a serious move has been made in the direction of naval disarmament.

ITALY: This Power is at present reorganizing its fleet, and shows no sign of disarming. On the contrary, it is planned to maintain a larger number of ships in commission, to increase the personnel from 40,000 to 45,000, and extend the period of service for naval recruits from twenty-four to twenty-eight months. A new building program has been adopted comprising five light cruisers, twenty destroyers, and twenty submarines.

OTHER POWERS: Most of the other Powers are mapping out schemes of naval development. Belgium intends to convert Zeebrugge into a naval base. Poland and Latvia have become naval Powers, the first-named with a personnel of five admirals, 248 officers, and 2,000 men, for whose training a school of navigation has been established at Dirschau. Gdingen, in the Gulf of Danzig, is to be developed as a Polish war harbor. The Latvian Government has approved a building program, to be completed in five years (four destroyers, four submarines, two minelayers). The fleet of Jugoslavia already contains more than twenty-one units, with a personnel of 2,000; it has a naval academy for officers near Ragusa, and a training school for petty officers at Sebenico.

Germany has completely lost her former naval position. Under the Treaty of Versailles she is permitted to retain in commission only six battleships and six light cruisers, besides a limited number of destroyers and torpedo-boats. She is forbidden to possess submarines of any description. The existing ships are mostly obsolete. Ten thousand tons is fixed as the limit of displacement for new armored ships and 6,000 tons for new cruisers. The personnel, including officers, numbers 15,000 men. In view of the financial situation there is no prospect of replacing antiquated material within the near future. Holland has prepared a new program for the expansion of her fleet (this has since been rejected by the Dutch Parliament), and Sweden has worked out a similar scheme, to have a duration of ten years. Spain is occupied with a far-reaching plan of naval construction, but financial difficulties stand in the way of its execution. The Spanish naval personnel consists of about 15,000 officers and seamen.

A Russian shipbuilding project has been adopted on a five-year basis for the purpose of reinforcing the Baltic and the Black Sea Fleets with a considerable number of new torpedo craft and submarines. During 1922 naval maneuvers were held in the Baltic, in which battleships, cruisers, and smaller vessels, including submarines, took part.

* * * * * * * *

Three great Russian battle cruisers which were laid down in 1912 and launched during the war, but never completed, have at length been sold to shipbreakers in Germay, whither they were recently towed by Dutch tugs—the *Borodino* and *Kinburn* to Kiel and the *Navarin* to Hamburg. As the ships had never received their boilers, engines, or armament, they drew very little water and had a freeboard of fifty feet. About 7,500 tons of ballast had to be placed in each vessel to bring it down to the proper trim. To manuever these large ships, each 730 feet in length and

nominally displacing 32,500 tons, through the canal from Petrograd to Kronstadt was a most difficult business, but it was accomplished without mishap. The passage from Kronstadt to Kiel was made in eleven days, in spite of heavy weather and high winds that rendered the top-heavy ships all but unmanageable. There is no information as to the fate of the fourth unit of this class, the *Ismail*, which may have been broken up at the Baltic Works in Petrograd, where she was built. These battle cruisers together with the four battleships of the *Gangut* class, represented the backbone of the great naval program fathered by Admiral Grigorovitch a few years before the war, and which, had it been completed on the outbreak of the struggle, might have enabled Russia to dominate the Baltic.

CURRENT NAVAL AND PROFESSIONAL PAPERS AND ARTICLES

"Bombs," Part I.—By William A. Bordens, *Army Ordnance*, January, February, 1924.

"Steam Turbine Beading"—First of a Series.—*Power*, 5 February, 1924.

"Experimental Investigation of the Effect of Wind Upon the Motion of a Projectile."—Second Lieutenant Philip Schwartz, O.D., *Coast Artillery Journal*, February, 1924.

"Reconnecting Direct Current Armature Windings—Lap Wound Armatures."—A. C. Roe, *Power*, 12 February, 1924.

"The Development of Modern Weapons."—Major General Sir W. E. Ironside, K.C.B., C.M.G., D.S.O., *The Journal of the Royal Artillery*.

"Mr. Churchill's Animadversions."—"As Mr. Winston Churchill in his book *The World Crisis* has thought proper, apparently for the purpose of justifying the conduct of the department of which he was the political head, to publish the war orders and other instructions issued by the Admiralty to the admirals at sea, I may perhaps be permitted a like liberty with regard to matters coming under my own observation, in order that the public may learn the truth. In my account of 'The Flight of the *Goeben* and *Breslau*,' I was, of course, scrupulous to respect the secrecy incumbent upon naval officers with regard to their instructions; and therefore I omitted certain particulars whose mention would have further enlightened the public as to the course of the operations in question.

"The late Sir Julian Corbett, in compiling his official history of the war at sea, naturally had access to all documents, and for the quotations he made from them he received the sanction of the Admiralty. As I had occasion to indicate in my book, neither Sir Julian's statements of what took place in the Mediterranean in the early stages of the war nor

his deductions from the facts, were invariably correct. For these inaccuracies, which reflected upon my reputation as a naval officer, Sir Julian Corbett and the Admiralty (in spite of their disclaimer) were responsible. But for Mr. Churchill's account of the series of operations which ended in the escape of the *Goeben* and *Breslau,* Mr. Churchill is alone responsible.

"It would appear that the purpose of Mr. Churchill in writing the history of *The World Crisis* was less to record what actually occurred than to demonstrate that in cases of mischance the Admiralty and the First Lord of the Admiralty, except in a few instances, were right and the admirals at sea were wrong. To the naval officer, and to perhaps the public as well, such a conception of the responsibilities of one who has held high office under the Crown, seems highly unusual. For the naval officer is accustomed to believe that the truth is more important than the reputation either of the Admiralty or of a Minister. Moreover, it has hitherto been regarded as the duty of the First Lord of the Admiralty to defend His Majesty's officers from unjust aspersion. Mr. Churchill, however, takes another view of his obligations. He proceeds upon the principle that the business of the First Lord of the Admiralty is to defend his own conduct at the expense of the reputation of His Majesty's officers."

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"My own case is not the only example of the aspersions cast by Mr. Churchill upon the reputation of naval officers. If a Minister, upon relinquishing his post, is to be permitted to publish secret official documents, to divulge the proceedings of Cabinet meetings, and to utilize the knowledge acquired during his official capacity, freely to criticize His Majesty's officers in order to exculpate himself and his department, I cannot but think that the honorable tradition hitherto governing the public service must cease to exist."

The above is quoted from a recent reprint of an article in *The National Review,* August, 1923, by Admiral Sir Berkeley Milne, Bart., G.C.V.D., K.C.B.

NOTES ON INTERNATIONAL AFFAIRS

FROM JANUARY 23 TO FEBRUARY 23

PREPARED BY PROFESSOR ALLAN WESTCOTT, U. S. NAVAL ACADEMY

RUSSIA

RYKOFF SUCCEEDS LENIN.—Former Premier Nikolai Lenin, who died on January 21, was buried on January 28 outside the Kremlin in Moscow. At the first session of the Russian Federal Congress of Soviet Republics, held in Moscow on February 2, Alexander Rykoff was chosen Chairman of the Federal Council of Commissars as Lenin's successor. Rykoff, though only forty-three years of age, is reported as somewhat broken in health, and the least active of the triumvirate composed of Kameneff, Stalin, and himself who took control during Lenin's illness. Rykoff joined the Bolsheviki party in 1903 and spent many years in exile in Siberia.

By the appointment of Dzerjinski as Chief of the Council of National Economy, in control of the great state industrial operations, it was believed that a real test would be given of the efficiency of state as opposed to private ownership and control. Dzerjinski as Minister of Railroads achieved remarkable success in extending operations and putting the railroads on a paying basis.

BRITISH AND ITALIAN RECOGNITION.—On February 1 the new Labor Government in England announced unconditional recognition of the "Union of Socialist Soviet Republics as *de jure* rulers of the territories of the old Russian Empire," with provision for the immediate appointment of ambassadors and settlement of questions of trade, debts, claims, etc., by negotiations in London. It was stated that if the British delegates gave reasonable assurances as to the liquidation of British claims, the British Government would be ready to offer credit and loans to be applied to the purchase of British industrial products, thus opening trade outlets of which England is in pressing need.

Italy and Russia signed a commercial treaty on February 7, and, in so doing, Italy gave *de jure* recognition of the Soviet Government, with promise of early establishment of diplomatic relations. The treaty contained provisions for exchange of Italian industrial products and Russian foodstuffs, and reserved Black Sea coastwise commerce to ships under the Italian flag.

The recognition of Russia by Great Britain and Italy, as well as by Germany, Norway, Poland, Turkey, Persia, Afghanistan, and other border

states, left only France, Japan and the United States among the major powers not represented at Moscow. Norway's recognition will probably be followed by recognition of Norwegian sovereignty over Spitzbergen.

GREAT BRITAIN

LABOR MINISTRY IN CONTROL.—Great Britain's first Labor Government, under Premier Ramsay Macdonald, took office on January 23. On the resumption of Parliament on February 12 the premier gave assurance that, while the policy of the government was in favor of reduction of armaments by means of international agreements, necessary measures of defense would not be neglected. Further expenditures on the Singapore base were held up pending a government inquiry. The premier stated that preferential trade agreements with British overseas dominions, promised at the Imperial Conference, would be submitted to vote of Parliament.

IMPORTANCE OF SINGAPORE BASE.—From New York *Times*, 7 February, 1924.—Hobart, Tasmania, February 6.—The acting Australian Federal Premier, Dr. E. C. G. Page, reviewing the results of the recent Imperial Conference in a public address here, said it was difficult to say whether the present British Government would proceed with the Singapore naval base or not, but it was clear that if Singapore or some other base was not constructed in the Pacific, the empire would be unable to maintain its capital ships in waters which now, from a strategic viewpoint, are probably the most important in the world.

Mr. Page added:

"The defense discussion at the Imperial Conference always proceeded on the assumption that Great Britain would construct the Singapore base. If that decision is not carried out, the whole question of empire defense must be reopened."

RELEASE OF GHANDI.—Mahatma Ghandi, the Nationalist leader in India who was imprisoned in 1922 for sedition as head of the non-cooperative movement, was released from prison on February 4 owing to ill health.

FRANCE

TAX BILLS APPROVED.—On February 23 the French Chamber by a vote of 354-218 approved Premier Poincaré's entire taxation and economy plan. Taken as a whole the new finance measure is expected to yield an additional revenue of 7,500,000,000 francs, including one billion in economies, one billion from more severe measures against tax dodgers, and four billion from new taxes and a twenty per cent increase of existing ones. The bill grants the Government full power for four months to carry out national reforms and economies by executive decree.

Action on the measure was hastened by the fall of value of the franc, and its passage was a notable victory for the Premier.

ITALY AND SOUTHEASTERN EUROPE

ITALIAN ELECTIONS ON APRIL 6.—The Italian parliamentary elections set for April 6 will be subject to the new election law passed by Mussolini

which provides that the party receiving a plurality of votes, not less than one-fourth of the total, shall be accorded two-thirds of the seats in the Chamber of Deputies.

The list of Fascista candidates published by Premier Mussolini on February 21 included the names of about 100 Italian leaders from outside the regular ranks of the Fascisti, notably former Premiers Orlando and Salandra. These additions were made to assure victory in Southern Italy, where the hold of Fascism is less sure than in the North.

FIUME TREATY SIGNED.—On January 27 Premier Mussolini for Italy and Premier Pashitch and Foreign Minister Nintchitch for Jugoslavia signed the treaty providing for the annexation of Fiume to Italy, annexation of Porto Barros by Jugoslavia, and establishment of friendly relations between the two countries. Important as the treaty of friendship with Jugoslavia is, Italy hopes for still more from the new commercial treaty. There is a belief that Italy's commercial relations with Jugoslavia will be close and mutually profitable. Italy exports chiefly manufactured articles while Jugoslavia exports agricultural products and each country needs the exports of the other. They do not clash as competitors in the European markets.

RESIGNATION OF VENIZELOS.—Owing to ill health M. Venizelos, on February 4, was forced to submit his resignation as Greek Premier. A new ministry was organized by M. Kafandaris, Venizelos' Minister of the Interior, whose policy, like that of Venizelos, favored submission to popular vote of the question whether or not Greece should become a republic.

GERMANY

SEPARATIST REGIME ENDED.—On February 12 the Interallied Special Commission appointed to investigate the situation arising from the Separatist movement in the Bavarian Palatinate and elsewhere in the Rhineland, announced its decision regarding measures to restore order in those regions. The decision ended Separatist control and established a temporary rule under the Palatinate Kriegstag, a local committee already in existence, pending resumption of control by the former German authorities.

REPORTS OF EXPERT FINANCE COMMISSIONS.—After a month's work in Berlin, the two committees of experts appointed by the Reparations Commission to study German finances left Berlin on February 12 and a week later resumed sessions in Paris. Final hearings were held, and the subcommittees on the German budget, currency, gold bank, etc., made reports as a preliminary to the drafting and submission of final recommendations to the Reparations Commission.

It was reported that in addition to the plan of a gold bank, supported in part by an international loan of about $500,000,000, the committee headed by General Dawes would recommend a mortgage of about ten

billion gold marks on German railroads and other sources of government revenue. These mortgage bonds would be taken over by the Allied Powers in the proportions of fifty-two per cent to France, twenty-six per cent to Great Britain, ten per cent to Italy, eight per cent to Belgium, and four per cent to other Allies, as agreed upon in the Spa Conference of 1920. The mortgage would not involve the advance of any money to Germany, but it would be represented in Germany by the issue of marketable German paper guaranteed by these resources. It was also suggested that the Dawes Committee would advise the abolition of the Franco-Belgian Régie now operating the Ruhr and Rhineland railroads and of the customs barrier between the Occupied Regions and the rest of Germany. The McKenna Committee, having completed its work, adjourned till March 3.

HUNGARY ACCEPTS LEAGUE RECEIVERSHIP.—It was announced on February 22 that Hungary had accepted the plan of reconstruction arranged under the League of Nations, and that an American, Mr. W. P. G. Harding, would be appointed Commissioner General. The total amount of the loan for Hungary will be $50,000,000, of which it is hoped to raise $20,000,000 in America. For two years Hungary will pay no reparations, but thereafter about $2,000,000 annually for twenty years.

INTERNATIONAL AGREEMENTS

TANGIER TREATY SIGNED.—On February 7 Spanish plenipotentiaries signed the Tangier Agreement, after receiving as a concession an enlargement of the Spanish share in the Tangier administrative machinery, and an extension of the rights of military occupation in the Ceuta and Melilla areas.

NAVAL ARMS CONFERENCE IN ROME.—A preliminary Conference on Limitation of Naval Armament, under the League of Nations, opened in Rome on February 14. The object of the conference was to settle upon a program and draft proposals to be considered at another conference to be held, if possible, next year, in an effort to extend to all countries the limitations agreed upon in the Washington Conference. After agreement in principle that limitations were desirable and necessary, the conference postponed new plans and projects until it had taken up the Washington agreements article by article.

Greece expressed willingness to give up a fleet almost entirely, provided Turkey would do the same. Unfortunately, Turkey has declined to send a representative to the conference.

Russia, which had consented to send a representative after the place of the conference had been shifted from Switzerland to Italy, included in her demands the stipulation that both the Black and the Baltic Seas be made closed zones, with the right to Russia of unlimited fortification of ports on those seas. Russia further indicated that in view of her frontage on four widely separated seaboards demanding four separate

forces of defense, she could not agree to limitations without very adequate guarantees in return.

The Spanish delegate withdrew from active participation on February 23 after the conference had disapproved the Spanish tonnage demands as too high.

LEAGUE TO DRAFT ARMS TRAFFIC CONVENTION.—Geneva, February 7.—(Associated Press).—The Disarmament Commission of the League of Nations, which has been in session here the past few days, decided today to hold a meeting in Paris, beginning March 24, to draft a definite convention for the control of the international traffic in arms.

The work has been entrusted to a subcommittee, of which Joseph C. Grew, American Minister to Switzerland who has been attending the commission's sessions, is a member.

The belief is expressed here that a way will be found to meet the objections of the United States Government to a Bureau of Control of the Arms Traffic functioning as part of the League. One idea advanced this morning was that all the members of the League would send all their arms traffic information to the League but that the United States be not obliged to do so, merely publishing its statistics through its own official channels.

Mr. Grew stated anew the position of cordial sympathy of the United States Government for the control of the traffic in arms.

Mr. Grew explained at the session that the laws of the United States were rigorous and that America was shipping no arms to any extent to the South American countries. He added, however, that the United States objected, among other things, to the St. Germain Treaty, because this treaty would prevent the United States forwarding arms to Latin-American states which had not signed the convention.

The United States, Mr. Grew declared, believed in the value of publicity on the whole problem of traffic in arms, but he said he could not say whether the United States Government would be represented at the conference of the Disarmament Commission, which is to begin in Paris on March 24 with the purpose of drafting a convention for the control of traffic in arms.

Viscount Cecil, representing Great Britain, replied that although the United States was not shipping any considerable amount of arms, it was also true that all States must sign the proposed convention before any single State would consent to enforcing its terms. There was necessity for obtaining universal accord, including the United States—in spite of that country's fine record—so that the other countries would feel easy in mind. Viscount Cecil emphasized the need of America's attending the Paris meeting, saying it was vital that the United States be represented if the meeting were to succeed.

Signor Schanzer, Italy, supported Viscount Cecil's arguments. He added that everybody was desirous of making the convention suitable to the United States.

UNITED STATES AND LATIN AMERICA

HONDURAS IN REVOLUTION.—On February 13 the United States severed diplomatic relations with Honduras, owing to the absence of any constitutional government in that country, although the American Minister remained in Honduras in an endeavor to bring the warring factions together. Constitutional government in Honduras ended on January 31 when

no one of the three candidates for the presidency received a majority at the polls or by congressional action. President Guiterrez, at the expiration of his term, assumed the powers of dictator pending a new election. Two of the rival candidates, however, Carias and Bonilla, undertook military operations to overthrow Guiterrez.

FAR EAST

JAPANESE LOAN.—Early in February an agreement was signed in New York by Japanese representatives and a group of New York bankers which provided for the issue to the American market of $150,000,000 of Japanese bonds. This sum, with £25,000,000 arranged for in London, is expected to cover the cost of reconstruction after the recent earthquake.

SECRETARY HUGHES WOULD MODIFY JAPANESE EXCLUSION MEASURE.—Following protests from the Japanese Foreign Office, Secretary Hughes on February 13 made public a letter written to the chairman of the House Immigration Committee seeking to modify the Japanese exclusion clause in the Selective Immigration Bill.

Mr. Hughes in his letter stoutly protested against the attempt to establish a general bar against subjects in entering the United States, stating it would result in the loss of the co-operation of the Japanese Government in controlling the movement of their people to the United States and adjacent territory.

"I am unable to perceive that the exclusion provision is necessary, and I must strongly urge upon you the advisability, in the interests of our international relations, of eliminating it. The Japanese Government has already brought the matter to the attention of the Department of State, and there is the deepest interest in the attitude of Congress with respect to this subject."

Mr. Hughes stated he was heartily in favor of suitable restriction of immigration and endorsed the proposed issuance of immigration certificates to those who would normally come under the immigration laws. He pointed out, however, that the questions of especial interest to the State Department are those in relation to the international effects of the proposed measure.

REVIEW OF BOOKS

THE SUMNER LINE OF POSITION. Published by the Hydrographic Office, U. S. Navy Department,—Designation H. O. 203. Price $2.25.

A Review by Commander John Downes, U. S. Navy

This publication has been looked forward to ever since word first came out that such a volume was in course of preparation. Many navigators have had in the back of their heads some idea that such a compilation was possible but all probably became overwhelmed at the size of the work involved. Millions of computations or tabular selections had to be made and carefully arranged with minute differences, and it was seen that only some well organized office especially equipped for the purpose could accomplish such a task. This the Hydrographic Office has done and done well.

In this volume, just received, a long felt want has been supplied. Who has not struggled with picking out functions, adding, subtracting, and multiplying, with the ship rolling and pitching and the gale roaring through the rigging, only after all was done to find that everything was all wrong—your finger slipped while picking out a haversine! With this book all one has to do is to compute the Greenwich Apparent Time and for this time the correct declination. Having reduced the observation to one of true altitude, the book does the rest.

The book contains five tables and sufficient explanatory text to make its use clear. Table 1 corresponds to Table 46 in Bowditch 1920, Table 2 to Table 49, Table 3 new, Table 4 to Table 7, and the last table is original and is the main object of the book. From it a line of position is obtained for the nearest subdivision of altitude. This line, called the "preliminary line," is then moved toward or away from the body observed an amount equal to the difference between the altitude selected and the true altitude observed. We then have the required line. Azimuths are taken from the table. The table can be used for observations either near the meridian, or near the prime vertical, for declinations between 27 N., and 27 S., and between latitudes 60 N., and 60 S. This table is to be supplemented by proposed publication H. O. 204 which will carry the limits of declination to 60 N., and 60 S., thereby increasing the number of heavenly bodies available for navigational purposes.

The book is very presentable in appearance, is well printed, and is somewhat larger than the 1920 Bowditch. It contains 869 pages, 847 of which are given up to the position line table.

It is believed this book will prove to be very popular though it is doubted if it will cause the old methods to be entirely abandoned.

Great credit is due those responsible for its conception, inception and publication.

AMERICA OF YESTERDAY. As reflected in the journal of John Davis Long, Governor of Massachusetts and Secretary of the Navy. Edited by Lawrence Shaw Mayo. The Atlantic Monthly Press. $3.00.

This book should prove most interesting to the general reading public, but for the naval officer it holds even a greater interest in that Mr. Long was Secretary of the Navy under President McKinley. In its last few chapters are revealed the innermost thoughts of the Secretary of the Navy during the trying ordeal of the Spanish-American War.

In its pages one meets again in vivid freshness, Presidents McKinley, Theodore Roosevelt, Admirals Sampson and Schley, Secretary of War Alger, Admiral Sicard, Captains Mahan, Robley D. Evans, Sigsbee and many politicians whose petty requests cause Mr. Long on several occasions to express his disgust of them in no unmistakable terms.

Theodore Roosevelt is seen first as Assistant Secretary of the Navy to Mr. Long, then impetuously dashing off to join the Rough-Riders in Cuba, and finally as President of the United States after the assassination of President McKinley.

Mr. Roosevelt's youth and dash as Assistant Secretary caused Mr. Long several uneasy moments. About him Mr. Long writes on one occasion, "He is so enthusiastic and loyal that he is in certain respects invaluable; yet I lack confidence in his good judgment and discretion. He goes off very impulsively . . . ." Again, ". . . . I feel that Roosevelt in his precipitate way, has come very near causing more of an explosion than happened to the Maine . . . . the very devil seemed to possess him yesterday afternoon. Having the authority for that time of Acting Secretary, he immediately began to launch peremptory orders: distributing ships; ordering ammunition, which there is no means to move, to places where there is no means to store it; sending for Captain Barker to come on about the guns of the *Vesuvius,* which is a matter that might have been perfectly arranged by correspondence; sending messages to Congress for immediate legislation, authorizing the enlistment of an unlimited number of seamen; and ordering guns from the Navy Yard at Washington to New York, with a view to arming auxiliary cruisers which are now in peaceful commercial pursuits."

When Mr. Roosevelt decided to resign to take part in the war, Mr. Long makes the following interesting observation, "He has been of great use; a man of unbounded energy and force, and throughly honest—which is the main thing. He has lost his head to this unutterable folly of deserting the post where he is of the most service and running off to ride a

horse and, probably, brush mosquitoes from his neck on the Florida sands . . . . And yet how absurd all this will sound, if by some turn of fortune he should accomplish some great thing and strike a very high mark!"

Captain Mahan, then on the retired list, returned from abroad to serve on the War Board. In spite of Mahan's reputation as a naval strategist, Secretary Long doubted if he would be "of much value practically." A little later in connection with Captain Mahan we find the following entry in Mr. Long's journal, "Captain Mahan is on the rampage again. He is very frank and manly; does not go around Robin Hood's barn but blurts out his entire dissatisfaction with the entire Naval War Board." Some time after this we find Secretary Long rubbing his hands in satisfaction over the fact that, "There was a very pretty scrimmage between Captain Mahan and Secretary Alger." This scrimmage resulted from the fact that Secretary Alger had begun "his usual complaint about the Navy," in spite of the fact that the Navy had provided him with transports to carry his troops, landed them, and had destroyed the Spanish fleet. Now Mr. Alger was grumbling because the Navy did not risk their ships in forcing the entrance to Santiago and capturing the city. At this point, Mr. Long writes, "But Mahan, at last, lost his patience and sailed into Alger; told him he didn't know anything about the use or purpose of the Navy and that he didn't propose to sit by and hear the Navy attacked."

There are many amusing incidents throughout the latter part of the book which will appeal to the Service reader especially. One such incident is that in which Secretary Long says, "I could not help laughing Saturday afternoon when he (Secretary Alger) came in and said his troops at Santiago had all landed, thanks to the aid of the Navy, but that the Army had no means of landing its provisions and stores. He said he was going to send a tug and a lighter for this purpose, and wanted to know if I could furnish convoy for them. That, I soon arranged. Whereupon he said. 'By the way, can't you lend me a lighter and a tug?'—evidently forgetting that he had intimated that he had them to be convoyed. So I furnished these also."

One is deeply impressed with the fact that Mr. Long must have been a most sincere and broadminded man who attended strictly to his duties with a fine sense of fairness to all. As Secretary of Navy, he never seemed to lose sight of the mission of his office and expressed the greatest contempt for job hunters and those who played party politics. It almost might be said that politics were secondary in Mr. Long's life, for while Governor of Massachusetts, he wrote one day, "I suppose people think I think of politics. Ah, how far away in other dreams I float."

Secretary Long was harassed by Congressmen from Pennsylvania who wished him to buy Pennsylvania anthracite coal for our ships; by others who wished men-of-war detailed to protect the home towns of their constituents; and by others still, who asked him to place their friends in all manner of positions in the Navy from acting appointments to laborers at

$1.50 or $2.00 a day in Navy yards. A certain Senator, Mr. Long writes, came in, "to tease me about the purchase of a vessel belonging to his brother."

The criticism of *America of Yesterday* so far has dealt with the last few chapters, for they are the ones which will interest the service reader most. The first portion of the book is the diary of Mr. Long, written for the most part, when he was a boy of nine at his father's farm near Buckfield, Me. This part of the book is most entertaining and one wonders at a boy of nine writing in such a grown-up manner. Extracts from this diary carry the reader through Mr. Long's school days, his years at Harvard and his start in law and politics, which finally culminate in his election as Governor of Massachusetts prior to his becoming Secretary of the Navy under President McKinley. It must be admitted that there is a certain lapse of interest between the amusing incidents of Mr. Long's boyhood and the time of his going to Washington, but the dullness of his school and college years in no way detracts from the interest of the book as a whole.

In short it is the life of the highest type of an upstanding American citizen who served his country faithfully; a scholar, poet, and pleasing public speaker, possessing a generous and sunny disposition that won the respect and admiration of all with whom he came in contact.

America of Yesterday is well worth reading.

A. S. W.

SEABORNE TRADE, (Vol. II). (From the Opening of the Submarine Campaign to the Appointment of the Shipping Controller). By C. Ernest Fayle. Longmans, Green and Company. $7.50.

No student of the history of the World War should fail to read Mr. Fayle's second volume of *Seaborne Trade,* for a just appreciation of the true character of the struggle and of its far reaching effects cannot be gained unless the problems of the seaborne trade and its influence upon the naval, military, and political war situations are fully realized. The casual reader, too, will find much of interest in this work, which presents, with a wealth of detail, the nature and the extent of the British seaborne trade, in its relation to the trade of the rest of the world, under the pressure and demands of war.

Beginning with the inauguration by Germany of her submarine campaign against shipping, in February, 1915, the author describes most minutely the varying vicissitudes of the war-effected British trade, under the gradually increasing government supervision and control, until the appointment of a Shipping Controller in December, 1916. One of the most striking impressions gained from this work is the unruffled and conservative attitude of the British Government in giving direction and assistance in the adjustment of the ocean-commerce to meet the unparalleled

war demands. Even under trying enemy activities, sight never seemed to be lost of the desirability of maintaining, as far as possible, the old trade relations and customary activities so that, when the war was over, Britain would still retain her trade ascendancy. This vision and foresight, brought out and heightened by Germany's lack of it, is seen again in the study of war problems before 1914. It was then that the safeguarding of sea-trade and the encouragement of shipping under war conditions had been particularly considered. But, even though, as early as 1909, Sir Frederic Bolton had brought before the Prime Minister the question as to whether the British ports would be able to maintain a steady flow of supplies under war conditions and though the study of the problem had been immediately undertaken, the full effects of such a danger were not appreciated until after the outbreak of the World War. Then it was, that the problem of port congestion, which was one of the most serious and difficult of the war conditions, affecting both seaborne trade and the waging of war itself, drew the early attention of one of the first appointed war committees, the Committee on Diversion of Shipping. The secretary of this committee, which served, in general, as "a link between the Government and the ship-owners in all questions affecting British shipping," made an official tour of inspection of all the ports. Three things he recommended: (1) The more effective organization of dock labor; (2) The pooling of freight cars; (3) The imposition of penalty rents for delay in removing cargoes from the docks and transit sheds. All of these suggestions were finally put into operation through the Port and Transit Executive Committee, which was appointed in November 1915 "to inquire into the difficulties and congestion arising from time to time at harbors, port and docks," in consequence of the demands of the army, navy, and Transport Department, of the extensive traffic in munitions and war materials, and the ordinary commercial activities—all congesting hopelessly the British ports.

The problem of obtaining sufficient tonnage either by chartering in the open market, by some especial agreement with steamship companies, by the Coal Freights Limitation Scheme, applied to French and Italian trade, by coal and bunker pressure, by Return Cargo Regulations, by the White List privileges, by the requisitioning of tonnage at *Blue Book* rates, or finally by the restriction of imports, constituted the main difficulty in carrying on the seaborne trade required by the war needs of both the British and the Allies. During the period treated, of almost two years, it was not the actual losses resulting from the German submarine campaign against merchantmen, but the loss of normal carrying power through forced circuitous routes to avoid submarine infested areas; through port delays, as a result of enormous increase of traffic in consequence of the war conditions; through great rise in freight rates; through imperative demands of the military, the navy, and the munitions and arms industries for more and more tonnage; and through the necessity of furnishing the Allies not only with supplies and munitions and arms for maintaining the war but also with essential supplies for the non-combatant population, that produced such a grave condition of affairs.

The decrease in the export trade, however, even as late as the summer of 1916, was due not to "shortage of tonnage" but to the "diversion of labor, plant, and material to war uses." The general tonnage situation, however, would have been much more serious in this period had it not been for the State Insurance Scheme, by which both hulls and cargoes could be insured against war risks. It was this security against financial disaster that maintained the flow of trade in spite of the growing submarine menace. At times the problem was not merely to obtain sufficient tonnage but to direct the available tonnage into certain essential but avoided trades. The two most conspicuous, perhaps, were the carrying of iron-ore from North African and Spanish ports, and of pit-props for the British collieries, from the ports of southern France, Spain, and Portugal. Finally, in March, 1916, with the appointment of an Official Ore-Broker, a regulation was issued "that all neutrals, even those on the White List, loading coal to South French or Bay ports, should return with approved cargo—that is to say, ore or pit-props." Great care was taken, however, in exerting such pressure upon neutral tonnage, for between one-fourth and one-third of the entire British foreign trade was carried in foreign vessels, most of which were neutrals, and to lose this tonnage would have been disastrous.

British consideration for neutrals throughout this period was most marked. And it was only as a measure of retaliation for the inauguration of the submarine campaign against merchantmen that the British Government extended the principle of blockade by the Order of Council of March 11, 1915 "to close those indirect channels of German trade which had hitherto escaped their control." Mr. Fayle, too, brings out most clearly, what some historians overlook, the reason for the British extension of the principle of conditional contraband when Germany appointed a Food Controller. Of all the neutrals, the Dutch and Scandinavians presented the greatest problems, for Great Britain depended upon them not only for some of her supplies but also, as in the case of Sweden, for a means of transit to Russia. Thus it was that these neutrals traded with both groups of belligerents.

By the last quarter of 1916 "all wheat, flour, and sugar imports were on Government account, and the Board of Trade were responsible for the purchase, transport, and distribution of the whole meat supply of Great Britain and the Allies." But the acute shortage of tonnage and the large proportion of British merchantmen already occupied in carrying essential foodstuffs made it extremely desirable to ascertain whether, by a "judicious system of rationing, the consumption could be decreased to such an extent as would appreciably relieve the strain of shipping, without seriously affecting the national health." In November the Government, therefore, decided to appoint a Food Controller and to investigate immediately the subject of rationing. The solution of this problem was in certain respects easier in England than in Germany, for the greater portion of the British supplies were imported and thus could be "controlled in bulk from the day of purchase." By this time, too, the demand had become imperative to

co-ordinate and tighten up the work of the various committees and departments by placing them under the "supreme direction of some authority possessing sufficient knowledge of the relative importance of military, naval, Allied, and commercial requirements to enable tonnage to be allocated on a scientific basis." As a result of this situation, Mr. Lloyd George, two days after he assumed the premiership, announced the appointment of a Shipping Controller with ministerial rank.

The book furnishes a valuable source of indispensable historical material and a vital view of the effects of war upon ocean-commerce. The general method, however, of treating the period by dividing it into quarterly phases tends to make it rather difficult to obtain, at first reading, the chronological development of the various angles of the subject. This is especially true of the gradual extension of government control over shipping and commerce. The elimination of the methods for combating the submarine menace, which, though interesting, do not seem essential to the subject, would, perhaps, serve to give the opportunity for a concrete summary of the complex phases of development. The subject, however, has been treated by Mr. Fayle most thoroughly and no student of the World War period can afford to neglect it.

H. F. S.

SECRETARY'S NOTES

Membership

Present Membership: 4,304. Changes since last report: New members, 8. Resignations, 9. Deaths, 2. Total Decrease, 3.

Membership and Subscriptions

There has been a certain amount of misunderstanding in some quarters regarding the change in subscription rates to the PROCEEDINGS, a notice of which has been published in these notes for a number of months. Membership in the Naval Institute, as heretofore, includes a subscription to the PROCEEDINGS, and the cost of membership (membership dues) remains unchanged. Regular membership is available only to officers of the Navy, Marine Corps, and civilian officers attached to the naval service. Associate membership is available only to officers in allied military services, or to persons in civilian life who are interested in "the advancement of professional, literary and scientific knowledge of the Navy," and only after application and election as such. Membership is entirely personal, and continues until resignation in writing has been received.

Subscription is available to any organization or person and is automatically discontinued at expiration. The subscription rate is $5.00 per year.

The special subscription rate of $3.50 per year is available only to members who wish to send gift subscriptions to their relatives or friends, in order to acquaint them with naval life and conditions. It is not available to societies, subscriptions for which must be at the regular rate.

1924 Dues

Dues for 1924 were payable on January 1. Bills this year were sent out in December, enabling those who desired to resign to do so as of the first of the year, thus saving the sending of additional bills for one or two months of the new year. All who have not already paid the current dues are urged to do so promptly, as the clerical work involved in sending out repeated bills is very great.

Change in Rules for Prize Essay 1925

Prior to 1918, essays were specially submitted in competition for the "Naval Institute Prize," the names of the writers being in sealed envelopes which were not opened until after the prize winning essay had been chosen. The Board of Control feels that the change in method of awarding the prize made in 1918 has not brought about the results anticipated; and has lessened, rather than increased, the amount of competition. The Board has, therefore, decided to return to the former practice of awarding prizes, commencing next year. The conditions governing this contest are published elsewhere in this issue.

New Books

It is not always that a book prepared as a textbook is of value to the service at large. There are, however, instances where books are of as great value to officers in active service as to the midshipmen for whom they are prepared. There are now just off the press three books each of which seems to fulfill that characteristic, and to have particular value to the officer who is preparing for his examination for promotion. These books are: "Leadership," $1.65; "International Law," $2.00, and "Notes on Naval Communications," $1.30, postage prepaid. Those interested should make application without delay, as the editions are not large, and will, in all probability, soon be exhausted.

Articles

The Institute desires articles of interest to all branches of the service, including the reserve force. Nonmembers as well as members may submit articles, and authors receive due compensation for articles published. Compact, well digested articles are more likely to be accepted for early publication. In accepting articles for publication, the Institute reserves the right to have such articles revised or rearranged, where necessary, in order to bring them up to the required standard of articles published in the PROCEEDINGS—the cost, if any, to be deducted from the compensation due the author.

Reprints of Articles

Twenty copies of reprints are furnished authors free of charge. Additional copies to the number desired will be furnished at author's expense, provided request is made before going to press.

Discussions Discussion of articles published in the PROCEEDINGS is cordially invited. Discussions accepted for publication are paid for at approximately one-half the rate for original articles.

Book Reviews As soon as practicable after the publication of books on subjects of professional interest, the Institute aims to publish authoritative reviews of them.

Address of Members In the past, many errors have resulted from the habit of changing an officer's address as soon as his transfer orders are published in the papers. No change will be made in the future except upon receipt of the Navy Directory, or notification by the member concerned. Reliance upon the former method may, in extreme cases, mean a delay of almost four months.

To insure the prompt delivery of the PROCEEDINGS and other communications from the U. S. Naval Institute, it is essential that members and subscribers *notify the Secretary and Treasurer without delay of every change of address.* No responsibility can be accepted for failure to receive the PROCEEDINGS, where members fail to comply with this rule. Changes of address should reach the Institute by the 25th of the month, to be effective for the issue of the PROCEEDINGS of the following month.

Coupons for Applications For the convenience of members making application for membership or for subscription, or informing the Institute of changes of address, a number of blank forms will be found elsewhere in this issue. It is hoped that members will take full advantage of these in order to reduce clerical work of all concerned.

H. G. S. WALLACE,
Commander, U. S. Navy, Secretary and Treasurer.

ANNUAL FINANCIAL STATEMENT

U. S. NAVAL INSTITUTE

BALANCE SHEET FOR YEAR ENDING 31 DECEMBER, 1923

ASSETS

Cash in banks			$ 28,599.50
ACCOUNTS RECEIVABLE			
Dues from members	$ 4,701.68		
Advertisements	417.62		
Book Sales	1,223.92		
	6,343.22		
Less Reserves for Bad Accounts	1,677.56		
		$ 4,665.66	
Interest accrued		1,825.17	
Total Receivables			6,490.83
OTHER ASSETS			
Bonds (par value)	123,000.00		
Adjustment to cost	9,286.66		
		113,713.34	
Books on hand	38,981.80		
Office Supplies	862.81		
Total Inventory	39,844.61		
Less Reserve	8,000.00		
		31,844.61	
Prepaid Royalty		45.64	
Furniture and Fixtures	2,488.39		
Less Depreciation	248.84		
		2,239.55	
Prepaid Expense		794.93	
Total Other Assets			148,638.07
			$183,728.40

LIABILITIES

ACCOUNTS PAYABLE			
Various Dealers	$ 2,374.90		
Accrued Royalty	91.37		
Total Accounts Payable		$ 2,466.27	
PREPAYMENTS			
Dues of Members	3,935.91		
Subscriptions to PROCEEDINGS	1,013.14		
Sundry Overpayments	351.83		
Unfilled Leadership Orders	238.65		
Total Overpayments		5,539.53	
TOTAL LIABILITIES			8,005.80
			$175,722.60

NET WORTH

RESERVE FUND			
January 1, 1923	$ 9,124.09		
Transferred to Surplus (previously improperly credited)	2,714.09		
Balance	6,410.00		
Life Fees for Year	40.00		
Total Reserve Fund		$ 6.450.00	
SURPLUS			
January 1, 1923	167,277.41		
Adjustment (see Secretary's Statement)	238.71		
Balance	167,038.70		
Profit and Loss Balance	2,233.90		
Total Surplus		169,272.60	
TOTAL NET WORTH			$175,722.60

PROFIT AND LOSS STATEMENT—YEAR ENDING 31 DECEMBER, 1923

PROCEEDINGS			
Cash Sales		$ 391.75	
Income Dues and Subscriptions	$ 15,517.60		
Less Bad Dues and Subscriptions	1,003.37	14,514.23	
Advertisements		2,760.93	
Binding		36.00	
Total Income from PROCEEDINGS		17,702.91	
Publishing Cost	17,011.12		
Payments to authors—articles	3,984.06		
Prize Essay Medal	26.45		
Prize Essay Award	275.00		
Total Cost of PROCEEDINGS		21,296.63	
Loss on PROCEEDINGS (excluding overhead)			$ 3,593.72
INSTITUTE PUBLICATIONS			
Sales		33,852.36	
Inventory January 1, 1923	37,605.02		
Purchases from printers	17,800.12		
	55,405,14		
Inventory December 31, 1923	38,694.90		
	16,710.24		
Royalty to authors of books	2,359.33		
Total cost of Sales		19,069.57	
Profit on Sales (excluding overhead)			14,782.79
PURCHASED BOOKS			
Sales		3,264.68	
Inventory January 1, 1923	951.86		
Purchases from other publishers	2,087.15		
	3,039.01		
Inventory December 31, 1923	611.90		
Total Cost of Sales		2,427.11	
Profit on Sales (excluding overhead)			837.57
Total Profit on book sales (excluding overhead)			15,620.36
Loss on PROCEEDINGS (excluding overhead)			3,593.72
Gross profit (excluding overhead)			12,026.64

OVERHEAD AND OPERATING EXPENSE		
Postage, Express and Hauling	1,681.12	
Office Expense	622.33	
Salaries	11,557.50	
Board Meetings	1,223.52	
Cost Collection (foreign checks)	16.06	
Advertising	509.83	
Insurance	27.50	
Depreciation	248.84	
Total Overhead Expense		15,886.70
Operating Loss		3,860.86
Income from interest on investments—banks		6,093.96
Profit and loss balance		$ 2,233.90

COMPARATIVE BALANCE SHEET
CHANGES IN NET WORTH FOR YEAR ENDING 31 DECEMBER, 1923

ASSETS

	Dec. 31, '22	Dec. 31, '23	Increase	Decrease
Cash in Bank	$ 23,047.33	$ 28,599.50	$ 5,552.17	.....
Dues Receivable	5,382.98	4,701.68	.....	681.30
Advertisements Receivable	360.81	417.62	56.81	.....
Accrued Interest Receivable	.....	1,825.17	1,825.17	.....
Accounts Receivable	5,756.47	1,223.92	.....	4,532.55
Subscriptions Receivable	11.45	.....	.....	11.45
Bonds	102,352.39	113,713.34	11,360.95	.....
Inventory	38,556.88	39,844.61	1,287.73	.....
Prepaid Royalty	245.64	45.64	.....	200.00
Furniture and Fixtures	2,950.66	2,239.55	.....	711.11
Prepaid Expense	989.16	794.93	.....	194.23
Authors' Rights	2,151.46	.....	.....	2,151.46
			$20,082.83	$8,482.10

LIABILITIES

	Dec. 31, '22	Dec. 31, '23	Decrease	Increase
Depreciation—Furniture and Fixtures	$ 586.63	.....	$ 586.63	.....
Accounts Payable	2,332.58	$2,374.90	.....	$ 42.32
Accrued Royalty Payable	74.13	91.37	.....	17.24
Prepaid Dues	765.79	3,935.91	.....	3,170.12
Prepaid Subscriptions	988.91	1,013.14	.....	24.23
Miscellaneous Overpayments	105.23	351.83	.....	246.60
Reserve for Bad Book Sales	550.46	.....	550.46	.....
Reserve for Bad Dues	.....	1,500.00	.....	1,500.00
Reserve for Bad Advertisements	.....	70.17	.....	70.17
Reserve for Bad Debts	.....	107.39	.....	107.39
Reserve for Bad Inventory	.....	8,000.00	.....	8,000.00
Reserve Fund	9,124.09	6,450.00	2,674.09	.....
Unfilled Leadership Orders	.....	238.65	.....	238.65
			3,811.18	13,416.72
TOTALS			$23,894.01	$21,898.82
Surplus Adjustment (See Secretary's statement)			238.71	
Profit and Loss Balance				2,233.90
			$24,132.72	$24,132.72

Comparative Profit and Loss Statements

	Calendar Year 1922 (as reported)	Calendar Year 1922 (as adjusted)	Calendar Year 1923
Sales—Institute Publications	$33,206.73	$33,206.73	$33,852.36
Cost of Sales	21,736.62	21,736.62	19,069.57
Profit	11,470.11	11,470.11	14,782.79
Purchase Book Profit	621.15	621.15	837.57
Total Profit Publications	12,091.26	12,091.26	15,620.36
Loss on Proceedings	3,982.28	4,985.65 (1)	3,593.72
Trading Profit	8,108.98	7,105.61	12,026.64
Operating Expense	17,924.47	17,914.94 (2)	15,886.70
Operating Loss	9,815.49	10,809.33	3,860.06
Miscellaneous Income	6,906.29	5,843.24 (3)	6,093.96
Profit or Loss	2,909.20 (loss)	4,966.09 (loss)	2,233.90 (profit)
Loss 1922			4,966.09
Net Gain			$ 7,199.99

In order to present a true comparison of two years, the profit and loss of calendar year 1922 has been adjusted so as to correspond with the method used in figuring the account for the year 1923, as follows:

(1) Loss on Proceedings has been increased by $1,003.37. This is the amount of bad dues charged off in 1923. The amount actually charged off for the preceding year was considerably in excess, but for the sake of comparison the 1923 figures are shown.

(2) The operating expense has been reduced by $9.53, wrongly included under that item.

(3) Miscellaneous income has been increased by the $9.53 mentioned in item two. It has been decreased by $403.77 for interest wrongly credited, and $649.75 for fluctuation in market value of bonds.

Adjustments to Surplus for Year 1923

DEBITS

Deduction of current dues by New Life Member	$ 3.00
Malkan (Bankrupt)	838.50
Reserve for Bad Dues	1,500.00
Reserve for Bad Advertisements	70.17
Reserve for Bad Book Sales	107.39
Reserve for Bad Inventory	8,000.00
Deduction for purchased authors' rights on books now defunct	1,680.88
	$12,199.94

CREDITS

W. B. Wetmore Legacy	$ 2,500.00
Interest on W. B. Wetmore Legacy	535.42
Adjustment of bonds to cost	5,070.76
Accrued interest January 1, 1923	1,140.96
Improper credits to reserve fund	2,714.09
Balance	238.71
	$12,199.94

During the past year there was charged off a bill outstanding since 1918, amounting to $1,388.96, the debtor firm having been declared bankrupt. This wiped out the reserve of $550.46 against bad debts, and the excess was charged against surplus. New reserves have been established as set forth in balance sheet and in adjustments to surplus above. These reserves will amply care for all prospective losses at the present time, including a number of books of which the Institute published large editions during the war, and of which the unsold balance is considerably in excess of any reasonable prospective sale.

The change in reserve fund noted above has been made to correct certain credits heretofore erroneously made, and certain credits omitted. The net change is as indicated and the reserve fund is now in accordance with Article VIII of the Constitution.

Accrued interest, formerly omitted from balance sheets, has been incorporated.

Bonds held by the Institute have been adjusted to cost instead of market, as the holdings are all of high grade and their value fluctuates only in accordance with the changing conditions of the money market. This is in accordance with the practice of many financial institutions. Unless so carried, a sale might be recorded as a gain which was, in fact, a loss on the original cost, or vice versa.

All the above adjustments have been made to surplus direct, in order that the profit and loss from operations for the year may be correctly shown.

The balance sheet as above set forth shows the correct condition of affairs of the Naval Institute as of this date.

Respectfully submitted,

H. G. S. WALLACE, COMDR. U. S. N.,
Secretary and Treasurer.

To the BOARD OF CONTROL.

Audited and found correct:

JOHN DOWNES, COMDR. U. S. N.
W. R. VAN AUKEN, COMDR. U. S. N.
M. S. TISDALE, LT. COMDR. U. S. N.

Approved by Board of Control, February 14, 1924.

H. G. S. WALLACE, COMDR. U. S. N.
Secretary and Treasurer.